Goulstonian Lectures

ON THE STUDY OF

GASTRIC FUNCTION IN HEALTH AND DISEASE.

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LECTURE II.*

IN the introductory chapter to his Lectures on Diseases of the Stomach, Brinton,[1] discussing symptomatology, writes as follows:—

"In short, the stomach is devoid of all common sensibility. But we are not therefore to imagine this important organ really insensible to stimulation; or to suppose that, because it is not every moment arousing the brain of its master, and demanding his forethought or exertion, it remains unimpressed and inactive. On the contrary, we must rather conclude that it has a special sensibility of its own; not one whit less marvellous (but surely more so) for possessing a certain independence of the cerebro-spinal centre. Closely related to this centre by the feelings of hunger and satiety—nay more, dictating to it (so to speak) those exertions which the proper alternation of these two states imperiously demand from the mass of mankind—it has a sphere of action altogether its own. And the study of digestion has shown us how admirably and silently the stomach fulfils its various and complex tasks; and how, incidentally to these, the unfelt particle of food no sooner touches its mucous surface than it excites the flow of a variety of secretions, both far and near, and provokes movements in the muscular substance of its walls and vessels, as well as in the analogous structures of neighbouring parts. To these acts, which respectively constitute the sensation and motion of the healthy stomach, its morbid states afford an instructive parallel. And just as the kind of sensibility specific to a healthy muscle—the feeling of its strength, its equilibrium, its measurable force—seems to be traceable, by gradual modifications through healthy fatigue to the feverish soreness of over-exertion, and through this to the universal muscular pain and prostration of various grave general ailments, so the indistinct sensation of the healthy stomach affords us the best clue to the acute sensibility of the diseased one; and allows us to trace a scale of similar kind—from satiety to repletion; from repletion to distension and weight in the epigastrium; and from hence to the dull heavy aching of dyspepsia, the gnawing or burning pain of ulcer, and the sharp agony of cancer of the stomach."

The latter portion of this passage was appropriately quoted by Hurst in his Goulstonian lectures on the Sensibility of the Alimentary Canal. I cannot refrain from quoting again the fuller passage, for in writing thus it seems to me that Brinton, with his clear perception and reasoning, anticipates the results of those later scientific inquiries to which I have already referred. He recognises that the muscle of the stomach, rather than its mucosa or its glandular structures, is the element principally responsible, not only for the proper performance of its digestive functions, but also for the appreciation of its states of comfort and discomfort. And at the same time he reminds us of the importance of endeavouring always to trace the gradations between states which can respectively be classified as physiological and pathological. However correct or otherwise it may be to introduce the analogy of skeletal muscle in discussing the functions of the plain muscle of the stomach, there can be little dispute as to the practical utility of that analogy. For just as I have in my first lecture pointed to the association of good appetite and healthy tonus with general well-being and muscular fitness, so, too, in reviewing symptoms we may correlate general hypersthenic and hyposthenic states with gastric hypersthenia and hyposthenia. Further, in the case of more local gastric disease we may frequently ascribe with reason certain pains and discomforts to fatigue, exhaustion, or over-activity of the muscle-fibre. The natural discomforts of hunger induced by fasting and attributable, as Carlson[2] has shown, to increased tonic and peristaltic activity may be traced through various morbid discomforts to the unmistakable hunger-pain of visceral disease. If a "sinking sensation" relievable by food is developed with unusual readiness it will commonly be found that the patient has a hypertonic and rapidly emptying organ. This symptom has been described by Hurst[3] as occurring in the healthy members of families with a tendency to duodenal ulcer, and in further support of his views on the "ulcer diathesis" he has described families in which several members actually developed proved duodenal ulceration. In my own practice I have encountered similar families. In the early phases of a chronic duodenal ulcer patients may describe sinking sensations before they develop actual hunger-pain, and between the sinking sensation and the hunger-pain is an intermediate type of discomfort sometimes referred to as a sense of local "pressure" in the epigastrium. In a comparable way the pain of angina pectoris is often preceded by a sensation of retro-sternal pressure or oppression, and it is of interest that the early discomforts both of angina and duodenal ulcer are commonly mistaken for flatulence by the patient.

If, instead of a sinking sensation before meals a sensation of fullness or repletion or weight after meals is too readily acquired, it will not uncommonly be found that the total capacity of the stomach has been diminished by structural disease, or (more rarely) by extreme hypertonus; that its emptying rate has been hampered by a narrowed outlet; or that its power of adaptability has been reduced by a loss of tone. The decision as to which of these divergent causes is likely to be responsible in an individual case must, of course, depend on an analysis of other elements in the anamnesis or the physical examination. Thus a good appetite in association with a rapidly developed sense of fullness after food suggests a small hypertonic organ. A much impaired appetite with a rapidly developed sense of fullness more probably points to grave structural disease of the stomach wall when the leading symptoms are of a local kind, or to hypotonus in states of general ill-health.

When it is stated that gastric pain originates in the muscle-fibre and reflects an exaggeration of the same factors which call forth appetite, hunger, and repletion, it should be clearly understood that reference is only made to the gastric *visceral* pain. It would be impossible in the time at my disposal to consider in detail the theories of Lennander[4] who demonstrated the insensibility of the viscera to ordinary stimuli, and of the late Sir James Mackenzie,[5] who for this and other reasons held that pain does not originate in the viscera, but is referred to the somatic tissues; or to the contentions of Ross,[6] Hurst,[7] and others, who have regarded visceral pain and referred pain as distinct phenomena. The latter view is now the more widely accepted, and of its probable truth we have daily reminders. Most careful observers, including members of our own profession, who have experienced severe visceral pain, locate it at a point deep to the body wall, and when confusion by the coexistence of referred pains or other distracting symptoms is not too great, their localisation is usually remarkably accurate. Furthermore, if normal sensations such as hunger or the desire to micturate are produced in the viscera—and I have not seen it urged that these sensations too are referred to the somatic tissues—it would at least seem reasonable to suppose that abnormal sensations must also have a local origin. During the past few years I have constantly registered observations relating to reflex phenomena in disease of the abdominal viscera, testing for the presence of cutaneous and muscular signs as a routine in almost every abdominal examination I have made.

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As a result of these observations I have concluded that indisputable viscero-sensory and viscero-motor signs persisting apart from a severe visceral crisis invariably point to the existence of an inflammatory or ulcerative lesion. I have not found such signs as cutaneous soreness and muscular guarding present in the gastric zone of reference in cases of gastric pain due to remote causes. During the healing of gastric and duodenal ulcers I have carefully watched the disappearance of these reflex signs, and I have not found them present in such conditions as pyloric stenosis, in which there was good reason to suppose that the active ulcer had been replaced by a scar. Conversely, the deeper the ulcer the more constantly have I found the signs to be present. Although they may be exaggerated or brought to light by a crisis of visceral pain these reflex signs may persist quite apart from the pain; indeed, in ulcer they may be present for days or even weeks after the disappearance of all spontaneous pain. In other words, the somatic phenomena of visceral disease are an expression not of the visceral pain but of the lesion, which, also by reflex mechanisms, causes the visceral pain. When visceral pain is due to mechanical causes, or occurs independently of a lesion, as in ordinary colic, or in response to some distant stimulus, as in appendicular dyspepsia, then there are no associated viscero-sensory or viscero-motor symptoms in the somatic zone served by the segment of the cord supplying the painful organ. The same observations have been confirmed in the case of other hollow viscera.

I have made this digression merely to emphasise my belief that gastric pain and the referred pains of gastric disease are separate manifestations and that the latter are not a mere reflection of the former.

Gastric pains may, as has long been recognised, be broadly classified into those which develop shortly after taking food and those which develop after a much longer interval, when the stomach is again becoming empty. These will be referred to respectively as "immediate" and "delayed" pain. Gastric pain persisting apart altogether from the act of eating can generally be traced to extragastric causes or to an extension of gastric disease beyond its seat of origin. Similarly, præcordial or retrosternal pains persisting apart from effort or emotion are usually extracardiac in origin. In other words, visceral pain has a definite relationship to visceral function and expresses perverted activity rather than structural disease. In clinical work so much depends on a proper appreciation of the nature and causes of a particular pain that it would seem desirable, notwithstanding the frequent discussions which have been devoted to this subject, to attempt once more an analysis of the two main types of gastric pain.

No lesion more clearly demands consideration of the causes of the pain associated with it than peptic ulcer. In gastric ulcer we have an example of "immediate pain," arriving rapidly after eating, and in duodenal ulcer we have an example of "delayed pain." In both conditions (though with less constancy in gastric ulcer) there is a definition about the pain and about its localisation and associated symptoms which render it peculiarly amenable to study.

Originally it was supposed that the pain of peptic ulcer was due to irritation of the ulcer itself by the physical contact of food or the chemical irritation of the gastric hydrochloric acid, the relief afforded by alkalies supporting the latter view. The first view is made improbable by the observation originally due to Hurst[7] that although food starts to enter the duodenum shortly after its ingestion the pain in duodenal ulcer does not develop until the stomach is nearly empty; furthermore, if friction were its essential cause, the pain would surely be more continuous from simple contact of the ulcer with the opposite wall of the empty viscus. That the pain is not due to the acid was also shown by Hurst,[7] who failed to produce it in several cases of gastric ulcer by the introduction into the stomach of 4 oz. of a 0·5 per cent. solution of hydrochloric acid.

Hurst concluded that gastric pain is an expression of hypertonus, excessive peristalsis and inhibition of pyloric relaxation—all factors liable to increase intragastric tension and tension in the muscle-fibre. In the case of ulcers near the pylorus he suggested that actual pylorospasm analogous to the anal spasm accompanying anal fissure might be an additional factor. He considered, however, that acid might indirectly cause the pain by promoting muscular action and preventing relaxation of the pylorus. Personally, I am doubtful whether it is necessary to introduce the acid factor at all. I have myself examined many cases of gastric ulcer, with extreme degrees of hypochlorhydria and a few with complete achlorhydria, in all of which the pain was just as severe and characteristic as in cases associated with a normal or high acidity. Given an irritative focus, the ingestion of food, or the readiness for it, even in the absence of acid secretion, is an adequate stimulus for the initiation of the exaggerated tonic and peristaltic action upon which the pain depends. Reasons will be given later for supposing that the relief of pain on giving sodium bicarbonate may be due to other factors than the neutralisation of acidity.

"DELAYED PAIN."

Hurst, in his Goulstonian lectures,[7] states that hunger pain develops when "only a small proportion of the food is still present in the stomach and the hypertonic condition constantly present in cases of duodenal ulcer reaches its greatest development, owing to the increase in tone which occurs as the bulk of the gastric contents diminishes." With this I am in entire agreement. In a more recent review[8] of the subject, however, he has ascribed the pain of duodenal ulcer to the great increase of pressure in the pyloric vestibule which arises when a peristaltic wave shuts off this portion from the rest of the stomach and food is simultaneously prevented from entering the duodenum by a reflex achalasia (or failure to relax) on the part of the pyloric sphincter. He also argues that the acidity plays a part in maintaining the pyloric achalasia, and that the relief due to food and alkalies is partly caused by diminution of the acidity. The sustained character of the pain, which shows no synchronism with peristaltic movements, does not to my mind accord with this hypothesis; and, further, if achalasia of the sphincter were so complete as to permit of a sustained rise in pressure, there would surely be delayed emptying instead of the normal or rapid emptying commonly present in these cases. M'Crea[9] has recently shown that complete separation of the pyloric antrum is a common event in the normal "J"-shaped stomach, but that it does not occur in the normal "steer-horn" stomach, the type with which duodenal ulcer is most commonly associated. I must also disagree with Hurst when he says that increased tension in the gastric muscle-fibre is the adequate stimulus for "the associated reflex symptoms of tenderness and rigidity in the corresponding segment of the rectus abdominis muscle."[8] The impulses constantly passing from the ulcer itself are the adequate stimulus for these signs, just as they are the adequate stimulus for the exaggerated tension of the gastric muscle-fibre. It is true that the signs may become more definite when spontaneous pain is present—that is to say, when there is increased stimulation of the ulcer—but my own observations, already referred to, have shown again and again that rectus rigidity and cutaneous soreness persist quite apart from the occurrence of spontaneous pain, and are absent in pyloric stenosis from a healed ulcer, a condition in which increased tension of the muscle-fibre must surely exist.

If it should become necessary, in the light of recent observations, to reject altogether the theory of "acid control" the development of a pathological degree of hypertonus in an organ already predisposed

to that condition would still be readily explicable. Carlson[10] has shown that any stimulus to the duodenum tends to produce contraction above; in the presence of duodenal ulceration the intensity of all stimuli is increased and gastric hypertonus and pain occur as soon as the diminution in the bulk of the gastric contents makes this possible. Pain disappears at those times at which relaxation of tonus (or adaptation of posture) develops in response to the introduction of food, fluid, or gas into the stomach. I believe that simple "adaptation of posture" is the essential relieving factor in the case of hunger-pain. Sodium bicarbonate is much more effective than bismuth oxycarbonate in producing relief. May it not be that this is due to the rapid evolution of gas and a more effective relaxation of tonus? Alkalies are less effective in cases and conditions in which achlorhydria has developed and gas is not evolved. Dr. E. P. Poulton and Dr. T. Turner tell me that an even more effective relief of pain in ulcer cases results if an effervescent mixture is given, and that such a mixture is in great demand among their hospital outpatients. The eructations produced by displacement of some of the gastric air-bubble give the sense of relief to the patient, but it is difficult to see why this should be the whole cause of the relief in duodenal ulcer, as any further reduction in content short of complete emptying would tend to increase rather than to lessen tonus. It is, however, probable that the pylorus, working in unison with the pars pylorica, also adapts its posture or relaxes when the gas is evolved and so facilitates emptying. Spencer, Meyer, Rehfuss and Hawk[11] have shown that sodium bicarbonate hastens the emptying of the stomach. The fact that relief in duodenal ulcer is also, and often more effectively, obtained with milk, water, whisky and water, or even small quantities of dry food, further suggests that relief of pain by alkalies is not specific but due simply to the adaptation of posture which follows eating or drinking. That the acid alone is not an adequate factor for the production of pain is supported by the observation that the resting acidity in the early morning is often the highest recorded acidity in the day; some of this must escape into the duodenum, but pain in duodenal ulcer does not occur as a rule before breakfast and usually disappears on fasting. For the production of the pain it is necessary to oppose a resistance to the contracted muscle-fibres in the shape of the small quantity of food present in the later phases of digestion, or, in other words, to induce fatigue in it by providing it with "work" at a time when its tonic activity is already exaggerated.

I have recently had under my care a colleague who had a gastro-jejunostomy performed 30 years ago for duodenal ulcer with stenosis. Later, after many vicissitudes, the stoma also became narrowed. In 1922 it was shown to be working inefficiently, and only the merest trace of barium passed out through the pylorus; at the same time he was found to have developed achlorhydria. With the advent of autumnal weather in 1924 he had a return of characteristic hunger-pain, night-pain, and relief by food. Alkalies were much less successful than in the past, but frequent small feeds, rest, and belladonna produced a steady improvement. His case exemplifies three points: (1) With a marked stenosis of the pylorus, which is now almost certainly incapable of contraction or relaxation, he had typical hunger-pain due presumably to general hypertonus of the pars pylorica. (2) The pain occurred in the absence of free acidity. (3) In the absence of free acidity alkalies failed to give the customary relief, not, I believe, because the pylorus was incapable of relaxation, but because with no evolution of gas no adequate relaxation of the pars pylorica was obtained.

We have a further clinical observation suggesting that pain of the type occurring in duodenal ulcer bears no necessary relationship to the acidity. The opportunity of confirming this observation we owe to our surgical colleagues. Briefly, it is that the whole of the subjective syndrome of duodenal ulcer can be closely and sometimes exactly simulated by disease of the gall-bladder or appendix independently of the chemical response. Many of us must have seen hunger-pain and night-pain and relief by food and alkalies in patients who were subsequently shown to have no gastric or duodenal lesion at all. In other words, the reflex hypertonus of the pars pylorica and pylorus may be induced in a normal stomach by a distant lesion, and although hyperchlorhydria secondary to the pyloric hypertonus is present in a certain proportion of these cases, it is by no means an essential accompaniment, and there may be a complete absence of free acid. Thus I have recently seen a case of chronic appendicular disease *with complete achlorhydria* in which the patient described pain in the epigastrium and feelings of flatulence coming on two and a half hours after breakfast and immediately relieved by lunch. The pain returned at half-past three and was relieved by tea, and at half-past ten in the evening, dinner having been at half-past seven. These pains were liable to keep the patient awake sometimes until two or three in the morning. I have also seen hunger-pain, night-pain, and relief by food in gastric carcinoma with achlorhydria.

Patients with duodenal ulcer describe their pain, when it arrives, as persistent, although sometimes of a "crescendo" character. It is never described as rhythmical or griping, although Carlson[2] states that a rhythmical quality can be dissociated from the sustained pain. Gastric "colic" or griping pain is experienced in acute indigestion from unsuitable food and as a preliminary to vomiting when the pylorus is strongly resisting the passage of indigestible fragments. It is seen also in early pyloric stenosis or obstruction, but here again the general hypertonus may tend to the production of a sustained rather than a rhythmical pain. The sustained character of the pain in non-obstructive duodenal ulcer is in favour of the view that it is due to hypertonus, probably involving the longitudinal as well as the circular fibres, rather than to segmentation by an increased peristaltic contraction as Hurst suggests.

In his recent experiments on the control of the pylorus in animals Carlson[10] showed that spasmodic contractions of the pylorus can be induced by injuring various abdominal viscera or by stimulation of the peritoneum, an observation which accords with clinical experience. I have seen the syndrome usually associated with duodenal ulcer closely reproduced by appendicitis; by cholecystitis or gall-stones with cholecystitis; by lesser curvature ulcers (particularly those situated at the pyloric end of the stomach); and more than once by carcinoma ventriculi. In one case the symptoms were simulated by the peripheral irritation of a small fatty protrusion through the linea alba; in another by excessive tobacco smoking. Even worry and overwork at times constitute the adequate stimulus. With a few exceptions my patients were men, and the majority of these were of the broad-chested and hypersthenic type, or lean and nervous. I believe with Hurst that the physiological "habitus" of the stomach is one of the main factors determining the nature of the dyspeptic response, and that on this hypothesis we can best explain the observation that the same symptoms may be evoked by such a variety of stimuli. The hypersthenic habitus is present more constantly in duodenal ulcer than with any other lesion, but when it is present in association with another lesion the same response is produced.

IMMEDIATE PAIN.

The pain due to ulcers of the lesser curvature develops within a quarter or half an hour to one hour of taking food, or sometimes rather later; it is relieved by vomiting, fasting, and alkalies. In a considerable proportion of cases of gastric ulcer the radiologist can demonstrate a spasm of the greater curvature opposite to the ulcer, the so-called "spasmodic hour-glass" appearance. That this spasm in itself is not the whole cause of the pain is obvious from the fact that it is often very persistent, and that

it may be demonstrated when no pain is being experienced. Nevertheless the spasm must be associated with a shortening of muscle-fibres, partly reflex in character, and (in the more chronic cases with deep ulceration) partly attributable to inflammatory changes, or commencing scarring in a group of the circular fibres; some such shortening is probably present in a lesser degree even when the "spasm" is not demonstrable. This shortening prevents or limits normal adaptation of tonus or posture when food is introduced, and therefore tension in the muscle-fibre is further increased and pain results. Getting rid of the food (by fasting or vomiting) is the surest method of relief, and relief by vomiting, whether spontaneous or induced by a finger in the pharynx, is commonly described by patients.

Some experiments reported by Poulton[12] support the foregoing conclusions with regard to pain in gastric and duodenal ulcer. With cases of ulcer of the lesser curvature Poulton found that his patients could obtain relief from their pain by swallowing the gastric tube into the proximal portion of the stomach and allowing an escape of some of its gaseous content. Conversely, by blowing air at known pressures into the stomach he could reproduce their pain. On the other hand, in a case of duodenal ulcer, inflation caused great distension but no pain. I am therefore inclined to think that the administration of sodium bicarbonate produces relief by facilitating belching in ulcers of the lesser curvature, but by causing relaxation of general and pyloric hypertonus in duodenal ulcer.

Just as the pain of duodenal ulcer may be simulated by the reflex effects of distant abdominal disease, so, too, the pain of gastric ulcer may be simulated. In this instance, however, the hypertonus is of a more local character and is referred to the fundic half of the stomach. Hurst[13] and Langdon Brown[14] have reported visualisation (with the X rays) of a gastric spasm induced by pressure over an inflamed appendix, and the occurrence of epigastric pain on pressure over McBurney's point in "appendicular dyspepsia" is a familiar observation. I have formed the impression that in men there is a greater tendency for duodenal ulcer and in women for gastric ulcer to be simulated by cholecystitis and appendicitis. This again accords with the hypothesis that, whether the focus of irritation be in the stomach, the duodenum, the gall-bladder or elsewhere, the nature of the response in the particular sex or type is commonly determined by the physiological tendencies or gastric habitus of that sex or type. With the hypersthenic habitus the response is "delayed pain"; with the hyposthenic habitus the response is "immediate pain."

In gastric carcinoma the two main factors underlying the production of pain are pyloric obstruction and rigidity of the stomach wall. The first causes pain by preventing evacuation and amplifying the tonus and the depth and number of the peristaltic waves; the second by obviating adaptation of tonus when fluid or food is introduced. In some cases of growth involving the body of the stomach there is remarkably little pain, and in these it may be found that there is a rigidly patent pylorus, and that evacuation is extremely rapid. Needless to say, other and more persistent types of pain develop when the growth has spread beyond the limits of the stomach and has begun to invade neighbouring structures.

The greater our experience of epigastric pains the less inclined are we to be dogmatic in our diagnoses based upon them, for careful investigation and laparotomy are continually revealing our deficiencies. These deficiencies depend partly, no doubt, upon inherent difficulties and our own shortcomings, and partly upon the inadequate powers of observation and description of our patients. Nevertheless, with better appreciation of the causes of visceral pain and the establishment of new methods of clinical inquiry we undoubtedly win by gradual stages to a higher standard of accuracy. In the words of Hilton[15] "every pain has its distinct and pregnant signification if we will but carefully search for it."

When probing the nature of a visceral pain it is as necessary to proceed with method as it is in the conduct of any other physiological experiment. Needless to say, the procedure is much more difficult and exacting than any laboratory exercise, but the information which may be obtained by careful questions from a patient of intelligence is often remarkable, and that the anamnesis is the most necessary part of the clinical inquiry is perhaps better illustrated in the case of the dyspepsias than in any other brand of internal medicine. When we pause to consider the interrogatory in respect of a gastric pain we find that—apart altogether from associated symptoms and referred signs—there are at least nine reasonable questions which may be put. Thus we may inquire as to: (1) The character of the pain; (2) its severity; (3) localisation; (4) extent of diffusion; (5) frequency; (6) duration; (7) initiating factors; (8) aggravating factors; and (9) relieving factors. Reasonable answers to only one-half of these inquiries, but particularly to numbers (1), (2), (3), (8), and (9) will again and again suggest a reasonable diagnosis. But if there is one principle which it is important to observe above all others it is that of endeavouring to see the patient at a time when he is actually experiencing his pain, or even to take steps to reproduce his pain by giving or withholding food. At such times he can more clearly define and locate his symptom, and at such times reflex signs, absent or inconspicuous on other occasions, are likely to be unmasked.

FULLNESS AND DISCOMFORT.

Fullness and discomfort which fall short of actual pain are due to identical mechanisms and depend on similar causes. In addition to local causes general disease and toxic or emotional factors may influence the health or tonus of the muscle-fibre in the direction either of relaxation or exaggerated action, so that we find in tuberculous, neurasthenic, and psycho-neurotic patients a frequent complaint of dyspeptic discomforts. These symptoms seldom have the severity or the defined characters of pain due to structural disease or reflexly induced by neighbouring or distant organic lesions. In their time relationship with meals, however, discomforts show the same behaviour as pains, and once more the nature of the response seems partly to be determined by the gastric habitus of the individual.

FLATULENCE.

Epigastric fullness and discomfort lead naturally to a consideration of the familiar symptom of gastric flatulence. In the vast majority of all cases gastric flatulence is due to swallowed atmospheric air. In health small quantities of air are swallowed with the saliva and the food, and the presence of a fundic air-bubble is always demonstrable by percussion and X ray examination. The sensation of flatulence and subsequent eructation can be reproduced in health by voluntarily swallowing air, or by taking an effervescent mixture, and by the gulping of air which involuntarily accompanies a choking fit. As has been mentioned eructations of a minor kind also accompany hunger. The sensation of flatulence is one of pressure or of fullness high up in the epigastrium or under the sternum, or sometimes more widely diffused about the chest; occasionally a pain is referred to the angle of the left scapula. In pathological flatulence the symptom may be produced by the habit of aerophagy or "air-sucking" irrespective of the physiological characters of the stomach. The sensation of flatulence may also be experienced with a normal air content in subjects with gastric hypertonus, and is then identical with the feelings of pressure which precede the development of pain in duodenal ulcer.

The habit of air-swallowing is developed for various reasons. It is a common symptom of anxiety states

and so occurs in the psycho-neurotic patient. I have on several occasions seen it initiated by the swallowing movements which accompany a sore throat or a chronic pharyngeal or naso-pharyngeal catarrh, and in this connexion I believe that a type of catarrh regarded by some laryngologists as secondary to a dyspepsia is often rather the cause of the dyspepsia. I have once developed aerophagy and flatulence myself for a short time after painting my throat with an iodine preparation. The symptoms may follow the administration of a general anæsthetic, particularly ether, in which case, I presume, the gulping movements during induction or the retching during recovery may initiate the discomforts and establish the habit. The soft diet and inefficient mastication necessitated by dental extractions commonly cause flatulence. Of the organic diseases with which the complaint of flatulence is associated duodenal ulcer and still more gall-stones and cholecystitis are the most important. In both there is a tendency to pyloric hypertonus and to feelings of epigastric pressure, sometimes (especially in the presence of gall-stones) of a "bursting character." These local feelings suggest to the patient the presence of an excess of gas in his stomach, and in attempting to eructate he sometimes aggravates the condition by swallowing more air. The retrosternal oppression experienced in angina, being mistaken by the patient for an œsophageal or gastric sensation, also commonly induces aerophagy. In aerophagy, however initiated, relief follows from time to time with an explosive effect when the cardia is forced by the accumulated gas in the fundus. Flatulence from aerophagy is odourless, tasteless, or mingled with the flavour of the food last taken. Gas resulting from diffusion into the stomach, if this occurs, must be very small in amount, and it is difficult to imagine any pathological state which would appreciably modify the rate of such diffusion.

Fermentation of food does not take place in the stomach excepting in association with pyloric delay, for the normal sojourn of the gastric contents is too short and the acid secretions help to inhibit bacterial action. I have never seen active fermentation occurring in the fractional specimens of healthy subjects at room temperature. On three occasions I have seen active fermentation at room temperature in specimens obtained from patients, and in each case the diagnosis was pyloric stenosis or obstruction. Fermentation is said to be more common in obstructive carcinoma because of the absence of free hydrochloric acid, but I have met with it also in pyloric stenosis from cicatrisation of an ulcer, and in traumatic stenosis following the swallowing of a caustic alkali; in each instance free acid was shown to be present. Flatulence occurring under these conditions may have the odour of sulphuretted hydrogen, and in any chronic dyspepsia with malodorous eructations organic interference with pyloric function should be suspected and will almost certainly be found. I have recorded the symptom quite as frequently in pyloric stenosis as in cancerous obstruction. In the case of a medical man whom I saw with Dr. A. F. Hurst and Mr. C. H. Fagge, eructation of sulphuretted hydrogen was the first and only prominent symptom of a carcinoma of the pylorus. Operation was performed without delay and the growth resected. The patient lived and remained at full work for more than two years.

ANOREXIA.

Loss of appetite has already been discussed in the process of reviewing the gastric element of the appetite sensation. The main disturbances of motor function accompanying anorexia are diminished tonus, or a pathological rigidity of the stomach wall. In otherwise healthy persons anorexia of a mild grade may result from severe or prolonged fatigue. Fatigue, whatever its pathology may be, is largely a muscular symptom, and the plain muscle of the stomach betrays the state of fatigue by loss of tone and loss of appetite. Profound emotion and prolonged worry may also impair gastric tonus, probably through the medium of the sympathetic nervous system, but as under these conditions there is often loss of sleep and physical rest, fatigue factors may again be contributory. In neurasthenia, whether due to physical or psychological stresses, or to intoxications, or to some combination of these factors, loss of appetite occurs for reasons similar to those already given. In all these conditions it should be clearly appreciated that there may not be a demonstrable hypotonus, for hypotonus is a relative term, and in a subject with the hypersthenic habitus the development of a normal or average tonus or of a lessened hypertonus may cause symptoms. In acute fevers and in chronic infective illnesses muscular tonus is impaired by the circulating toxins. In mental disease and the anorexia nervosa of Gull, the initial factor may be mental depression or a simple refusal to eat, but at a later stage exhaustion and relaxation of tonus complete the vicious cycle. In chronic alcoholism loss of appetite is probably to be attributed partly to the general effects of the poison on muscular function and metabolism, and partly to the excessive secretion of mucus which inhibits normal stimulation of the gastric mucosa and consequently the appetite stimuli directly due to eating. Beaumont[1] showed that acute alcoholism in the case of Alexis St. Martin might result in superficial lesions of the mucosa with suppression of secretion and stagnation of food, but Alexis did not always experience gastric symptoms or loss of appetite in the presence of these changes. Carlson,[2] producing alcoholic intoxication in dogs, demonstrated an abolition of tonus and hunger contractions coincident with refusal of food and vomiting. In carcinoma of the stomach, and especially in diffuse carcinoma, anorexia is almost as constant a symptom as pain, and in the absence of a palpable tumour or metatases more surely directs attention to the diagnosis than any other symptom or sign.

The anorexia of fatigue is cured by rest. The toxic anorexias are cured by the withdrawal of the poison. The anorexia of infective states is relieved by the termination of the infection or (as in pulmonary tuberculosis) by improving the patient's response to it. The anorexia of carcinoma ventriculi cannot be relieved, as nothing can restore the tonus of the muscle.

In all the common forms of anorexia, apart from that due to carcinoma ventriculi, in which it becomes continuous, the symptom is observed with curious frequency in the morning. The breakfast appetite is usually poor in the alcoholic and in the exhausted or tuberculous patient. Whether this expresses an incomplete recovery from the fatigue or toxins of the previous day, aggravated perhaps by unrefreshing sleep, or whether under these circumstances the stomach requires the actual ingestion and the stimulant and restorative effects of food before it can register a tonic response, I do not know. Possibly in toxic and fatigue states minor variations in the blood-sugar, upon which the activity of muscle in part depends, may be a factor, for in the early morning the blood-sugar is normally at its lowest level.

EXAGGERATED HUNGER AND BULIMIA.

Exaggeration of hunger and appetite is seen in the early stages of diabetes and sometimes in Graves's disease; later, when a general debility supervenes, it may be replaced by loss of appetite. Bulimia, or an abnormal hunger or craving for food appearing without obvious cause, is generally psychogenic, but it may accompany cerebral tumours. The only records of the symptom in my own case-notes were among the nervous dyspeptics.

NAUSEA.

In speaking of hunger and appetite I have been careful to insist that their gastric elements alone were under review. Other and more general disturbances, including malaise, weakness, sweating, and salivation,

commonly accompany nausea, but few would deny that it includes a local gastric element. In health nausea is induced by disgusting sights, smells, and emotions; is experienced in acute fatigue, and accompanies early pregnancy. Oily and fatty foods and remedies, which are known to inhibit gastric motility and secretion, readily induce it, and more so in persons who have small appetites and hypotonic stomachs, and whose food requirements are low, or in persons with normal food requirements when these requirements are diminished by hot weather. Nausea frequently accompanies feelings of faintness, and Barclay[17] has observed a drop of 3 inches in the lower border of the stomach just before fainting occurred. In another instance "a normal stomach dropped an inch or more when the patient smelt something which, to him, was nauseating. Asafœtida and various other disgusting substances were tried, and the reaction seemed to be proportionate to the revulsion of the patient." Bennett and Venables[18] showed a striking fall in the acid curve and much delayed emptying with the fractional test-meal in an individual to whom they suggested nausea under hypnosis. In disease nausea is especially common in chronic gastritis, whether from alcoholism or oral sepsis, in chronic biliary infections, in jaundice, in severe anæmias, and in the presence of any severe peripheral pain. It is an accompaniment of ocular disturbance, such as astigmatism, and labyrinthine disturbances, such as sea-sickness and Menière's disease. The available evidence suggests that nausea is an inhibition effect—that is to say, it results from conditions opposed to those which induce gastric pain. In this connexion it is interesting to note that (although it is evoked by other severe pain) nausea does not accompany the more painful dyspepsias. It is debatable whether the inhibition accompanying nausea is associated, as some suggest, with the closure of the pylorus which occurs during vomiting. Bile certainly tends to regurgitate into the stomach in association with nausea and retching, and this would rather indicate a relaxation of the pylorus in concert with the general relaxation.

Mention must be made of the confusion which exists between the sensations of nausea and hunger. To feel "sick with hunger" is a popular phrase and has a foundation in truthful observation. The nausea of pregnancy is commonly regarded as a perversion of hunger and may be relieved by food. I have frequently experienced temporary nausea on being abruptly wakened from sleep and called out at night, and on these occasions relief has followed the taking of food. In pathological nausea there is generally not only anorexia but actual loathing for food. Carlson[2] found in his own starvation experiments that nausea developed towards the end of his five days' fast, but that gastric tonus and peristalsis were increased rather than diminished during this period. He concludes that the changes responsible for this altered sensation may be partly increased irritation of the gastric mucous membrane and partly increased irritability of the central nervous system. It has occurred to me, however, that the nausea which is confused with or accompanies hunger may possibly depend upon the sudden relaxations at the end of strong hunger contractions. In pathological nausea the symptom is frequently described by the patient as "coming in waves," and there seems to be no particular reason why waves of relaxation should not under certain circumstances be appreciable in addition to, or at the expense of, the waves of contraction.

OTHER DYSPEPTIC SYMPTOMS.

Four other dyspeptic symptoms—heart-burn, water-brash, acid regurgitation, and simple regurgitation of food—are, strictly speaking, œsophageal rather than gastric in origin, but as they depend on derangements of the function of the cardia and accompany motor disturbances of the stomach, they may conveniently be considered here.

The relief effected by alkalies in *heart-burn* has long caused it to be regarded as a symptom of acid regurgitation into the œsophagus, and even of hyperacidity. The symptom must, however, be carefully separated from "acidity," for it can occur in persons with normal curves and achlorhydria, and, as Hurst has shown, cannot be reproduced artificially by hydrochloric acid or organic acids introduced into the œsophagus. Hurst[7] regards it as due to regurgitation of alcohols resulting from the action of yeasts or sarcinæ on carbohydrate food. Others, including Payne and Poulton,[19] believe it to be associated with spasm of the cardia or lower end of the œsophagus. The symptom is usually described as a "burning" sensation, and is felt behind the lower end of the sternum. Most of us experience it at one time or another, but occasionally it becomes a chronic and troublesome complaint. In my own practice it has occurred most frequently in the dyspepsia accompanying the early months of pregnancy, in visceroptosis, and in certain types of nervous dyspepsia. Occasionally it is described in duodenal ulcer, but it is not a common association of organic disease. If Poulton's view is correct the relief with sodium bicarbonate may be due to an increase in size of the fundic air-bubble and relaxation of the cardia.

True *acid regurgitation* is due to reflux of acid chyme into the œsophagus or mouth, where it may give rise to a sour taste and roughening of the teeth. It is the only subjective manifestation of hyperchlorhydria, but is present in only a small proportion of cases. No great reliance can be placed upon the patient's description, for it is often confused with heart-burn, and I have been told by a medical man with complete achlorhydria secondary to cancer of the stomach that he was much troubled by "acid regurgitations." Possibly the symptom may have been due to organic acids in his case.

Water-brash, or the regurgitation of mouthfuls of clear, tasteless fluid, is believed by Hurst[20] to result from accumulations of ordinary saliva and mucus in the œsophagus, owing partly to excessive secretion and partly to reflex closure of the cardia. I have myself seen it most frequently in cases of duodenal ulcer, and it is common in chronic gastritis.

Regurgitation of food from the stomach without straining, retching, or nausea, should be distinguished from the trick of rumination, and is due to relaxation of the cardia. In the few cases in which I have noted the symptom it has been an association of physical fatigue and mental anxiety in hyposthenic individuals. It was best exemplified by the case of a medical student who only developed it at times when an examination was imminent and he was taking no exercise; physical and radiographic examination revealed no abnormality. It is important to recognise that regurgitation of unaltered food *from the œsophagus* occurs in the opposite condition of achalasia of the cardia.

DISTURBANCES OF MOTOR FUNCTION.

The subjective manifestations of disturbed tonus have been considered in the foregoing sections, and although by a comparison of these with the habitus of the patient and with other associated symptoms and signs it may be possible to suspect clinically what the radiologist graphically reveals, it is obvious that no precise clinical estimate of tonus can be expected. There are no direct objective physical signs of hypertonus and hypotonus excepting in the extreme examples which accompany respectively the earlier and very late phases of duodenal or pyloric stenosis. These signs are more correctly discussed under the section dealing with disturbances of motility or emptying-rate. The radiographic signs of hypertonus include: (*a*) high position of the stomach with the pylorus low in relation to the greater curvature; (*b*) transverse direction of the long axis of the organ; (*c*) high position of the upper fluid level; (*d*) normal or less than normal content. These signs

are, as Carman[21] points out, more likely to be of pathological import if they do not correspond with the habitus of the patient. Occurring in about 17 per cent. of healthy men and 7 per cent. of healthy women hypertonus is found with greater frequency in certain classes of dyspepsia, and particularly in the reflex dyspepsias due to duodenal ulcer and gall-bladder disease. We have no evidence as to the frequency of hypertonus in these conditions before the development of the irritative lesion.

The radiographic signs of hypotonus include (*a*) low position of the greater curvature, with the pylorus high in relationship to it; (*b*) vertical position with "J"-shaped stomach; (*c*) low position of the upper fluid level; (*d*) content normal or larger than normal. Occurring in 4 per cent. of healthy men and 15 per cent. of healthy women the incidence of hypotonus, usually without any gastric lesion, is much higher in the various conditions causing general debility and in visceroptosis; in association with ulcers of the lesser curvature in women considerable degrees of hypotonus are also found. There is seldom any justification for a diagnosis of "atony" or "dilated stomach" excepting in the presence of signs pointing to pyloric or duodenal obstruction, or to prolonged or repeated "pylorospasm" of reflex origin. Excepting in "acute dilatation" of the stomach, which is now believed to be due to obstruction of the third part of the duodenum by the mesenteric vessels, atonic dilatation is always a process of gradual development.

Finally, tonus may be greatly modified or altogether abolished in infiltrating diseases such as carcinoma and syphilis of the stomach. Care on the part of the radiologist is sometimes necessary to distinguish between a small high-placed hypertonic organ with rapid emptying, and a stomach with diffuse carcinoma of its wall, a narrowed lumen, and rapid evacuation due to rigidity of the pyloric canal.

PERISTALSIS.

The subjective symptom of excessive peristalsis is recurring pain of a griping or colicky character, in which the passage of the pain from left to right may be noted by the patient himself. It occurs in acute indigestion from unsuitable or irritating food, and in a chronic and more severe form is seen only with lesions which obstruct the pylorus or first part of the duodenum. Peristalsis visible through the abdominal wall nearly always implies organic obstruction. From the radiologist's point of view the abnormalities of peristalsis include (*a*) an increase in the number and depth of the waves; (*b*) irregularity in the occurrence of the waves; (*c*) anti-peristalsis; (*d*) absence of peristalsis. Hyper-peristalsis, with increase in the number and depth of the waves involving both curvatures, is most commonly seen in association with a constricting duodenal ulcer. It may, however, accompany non-obstructive duodenal ulcer or the reflex dyspepsias due to appendicular or gall-bladder disease, conditions in which "pylorospasm" is presumed to occur; Carman[21] states that under these circumstances there is less tendency to exaggeration of the depth of the waves. He also observes that the hyper-peristalsis of pyloric or præ-pyloric obstruction from growth is more erratic in character and affects chiefly the greater curvature. Anti-peristalsis, in his experience and that of most radiologists, is nearly always due to organic obstructive disease.

All the extreme disorders of tonus and peristalsis are therefore seen to be associated with organic disease of the pylorus or duodenum, or with conditions producing "pylorospasm." The balloon experiments of Carlson[2] confirm the clinical and radiographic observations with regard to the augmentation of tonus and peristalsis in the early stages of obstruction. The more complete the obliteration of the pyloric lumen and the longer its duration, the more irregular and intermittent become the peristaltic contractions. In the final stage the appearance after a barium meal is that of a greatly dilated, atonic, and inert sack with the greater curvature low in the pelvis. Peristalsis is also abolished by infiltrating disease of the stomach wall.

MOTILITY (OR EMPTYING-RATE).

Motility may be either impaired or exaggerated by disease. The clinical signs of impaired emptying are vomiting, enlargement of the stomach, and visible peristalsis. Vomiting, it need hardly be stated, occurs as the result of a great variety of local and peripheral stimuli. Thus it may be due to irritation of the gastric mucosa, to general fatigue, to local gastric fatigue through over-eating, to intoxications, to central nervous lesions and psychic disturbances, to spasm or organic narrowing of the pylorus or the duodenum, to mid-gastric constrictions, or to inflammatory or obstructive lesions lower down in the alimentary tract.

The movements bringing about the act of vomiting are largely extra-gastric, and need not here be separately discussed. The pyloric end of the stomach is in strong contraction during the act, while the resistance of the cardia is overcome by the great increase of pressure in the fundic portion produced by the combination of the pyloric closure, descent of the diaphragm, and contraction of the abdominal muscles. I was recently demonstrating a case of pyloric obstruction with visible peristalsis to my clinical clerks when one of them observed a definite reverse peristaltic contraction. Exactly at that moment the patient, who had not been complaining, exclaimed that he felt an urgent desire to be sick. It is possible that the act of vomiting, even apart from obstruction, may be associated with reverse peristalsis.

From the appearance, odour, amount, acidity, and bacterial content of the vomitus in chronic cases and from the length of time over which recognisable particles of food are retained, it has long been customary to decide between organic and functional pyloric closure, and even to draw conclusions as to the cause of the obstruction. Visible peristalsis and enlargement of the stomach to palpation may become apparent before extreme dilatation and stenosis have developed, and even occasionally before delay and stenosis are radiographically demonstrable. In this stage the stomach muscle is hypertrophied and by its hypertrophy and vigour is successful in overcoming the obstruction. With improved methods of diagnosis and earlier and more skilful surgery the extreme degrees of gastric dilatation with persistent succussion splash and copious obstructive vomiting have now become comparatively rare.

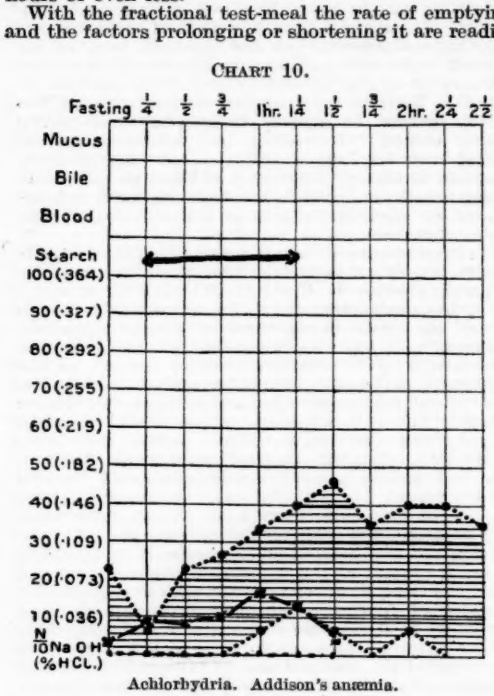
From the radiographic point of view delay of a substantial portion of a barium meal beyond the six-hour limit is due to organic obstructive disease. In cases of great loss of tone from general ill-health, when the stomach is low in the pelvis, there may occasionally be delay even up to six hours if the patient is in the erect posture, but by lying down, and particularly by turning on the right side, emptying within normal limits of time may be encouraged. Delayed emptying may also be estimated by the Ewald test-meal, and a simple practical method of determining the presence of pyloric stenosis is that attributed by Cohnheim[22] to Boas, in which a meal including raisins or currants is given overnight and the stomach is emptied with an ordinary gastric tube or Senoran's evacuator in the morning. In the presence of obstruction the more fluid portion of the meal escapes but the raisins remain.

Abnormally rapid emptying or hypermotility occurs in a certain proportion of cases of duodenal ulcer with hypertonus; in carcinoma ventriculi, with a rigid pylorus; in association with achylia gastrica, in which a condition of pyloric insufficiency is present; and after gastro-jejunostomy and partial gastrectomy. Rapid emptying can only be inferred indirectly by clinical means. An unduly rapid development of sinking sensations or of pain in duodenal ulcer; morning diarrhœa or post-prandial diarrhœa in so-called achylia gastrica and in Addison's anæmia;

and post-prandial discomforts in the small intestine after a gastro-jejunostomy may all suggest the presence of the abnormality. In any of these conditions the barium meal may be completely evacuated from the stomach within periods as short as two hours or even less.

With the fractional test-meal the rate of emptying and the factors prolonging or shortening it are readily

CHART 10.



Achlorhydria. Addison's anæmia.

studied. The information obtained with the gastric tube is probably more accurate than by other methods and we have the advantage of a normal standard for comparison. In cases of moderately advanced or extreme stenosis or obstruction the test serves the purpose of a 12-hour as well as a fractional test, and the resting juice contains a turbid malodorous residue from the day before. In less advanced cases of duodenal stenosis large quantities of clear and highly acid juice are withdrawn in the first specimen. In the absence of such indisputable evidence in the resting fraction delayed evacuation of the gruel beyond three hours is nearly always found to depend on organic disease, but other evidence than prolongation of the meal should be sought. When, for instance, sedimentation in the rack of tubes has taken place it is noticed that the level of the gruel, instead of falling steadily in the later specimens, is maintained, while in cases due to stenosis from ulcer there is an increase in the clear supernatant fluid. Reflux from the duodenum is naturally inhibited by stenosis, and bile regurgitation was completely absent in 11 out of 12 cases of pyloric stenosis and obstruction whose test-meal findings I have previously reported.[23] Active evolution of gas may sometimes be observed in the specimens. Chemical findings to be discussed later serve to indicate the cause and degree of the stasis, so that with organic narrowing of the pylorus the fractional method becomes a diagnostic test. In all other conditions it supplies evidence only as to the type of the functional derangement.

In the conditions showing hypermotility the fractional test-meal shows disappearance of starch in periods varying from half an hour to one hour. If the hypermotility is due to hypertonus there is a high curve of acidity; if it is due to a patent pylorus there is a low curve or achlorhydria.

DISTURBANCES OF SECRETORY FUNCTION.

The only symptom directly suggesting hyperchlorhydria is acid regurgitation; its unreliability has already been mentioned, and it is obviously secondary to motor disturbances. There is no direct clinical evidence of hypochlorhydria, achlorhydria, or achylia, but the presence of the two last-named symptoms may occasionally be surmised from associated symptoms such as acne rosacea and painless diarrhœa. This lack of any direct subjective evidence of secretory abnormality is wholly consistent with the opinion already emphasised that gastric sensibility is a function of the musculature and not in any way to be related to chemical changes.

Although extreme degrees of hyperchlorhydria and complete achylia (as has been shown) may be associated with perfect health and comfortable digestion, this does not imply that the symptoms have no clinical significance, for it is beyond dispute that both occur with a much greater frequency in disease. In a series of 187 cases of dyspepsia from all causes personally collected and investigated I found 62 per cent. of normal curves, while 30 per cent. showed hyperchlorhydria and 8 per cent. achlorhydria. The incidence of the two extreme conditions was thus nearly four times the normal in the case of hyperchlorhydria, and double the normal in the case of achlorhydria. In Bell's[24] much larger series (vide Table V.), which includes other than dyspeptic diseases, the figures were as follows: Normal curves, 61 per cent.; hyperchlorhydria, 24 per cent.; achlorhydria, 15 per cent.; hyperchlorhydria here showing three times and achlorhydria rather more than three times the normal incidence.

TABLE V. (*Bell.*)

A Comparison Between the Percentage Incidence of the Six Types of Curves in Various Diseases, with the Normal.

Disease.	Number of cases.	Percentages.					
		Achlorhydria.	Hypochlorhydria.	Low normal.	Normal.	High normal.	Hyperchlorhydria.
Normal (Bennett and Ryle)	100	4·0	1·0	10·0	59·0	18·0	8·0
Chronic gastritis	11	45·4	18·1	9·0	0	18·1	9·0
Gastric ulcer	24	4·1	12·5	16·6	20·8	25·0	20·8
Carc. of stomach	10	30·0	30·0	20·0	10·0	10·0	0
Duodenal ulcer	34	0	0	11·7	8·8	26·4	53·0
Nervous dyspepsia	37	5·4	10·9	8·1	27·0	8·1	40·5
Gastro-jejunostomy sequelæ	22	18·1	18·1	22·7	18·1	4·5	18·1
Visceroptosis, including gastroptosis	19	10·5	26·3	26·3	15·7	0	21·0
Gall-stones	7	14·2	0	0	57·1	14·2	14·2
Chronic appendicitis	13	23·0	0	7·6	38·4	7·6	23·1
Addison's anæmia	6	100·0	0	0	0	0	0
Tabes dorsalis	9	11·1	11·1	22·2	22·2	11·1	22·2
Disseminated sclerosis	8	0	12·5	12·5	50·0	25·0	0
Rheumatoid arthritis	8	37·5	12·5	12·5	0	0	37·5
Neurasthenia	20	10·0	30·0	5·0	25·0	5·0	25·0
Psychasthenia	11	9·0	18·1	9·0	45·4	18·1	0

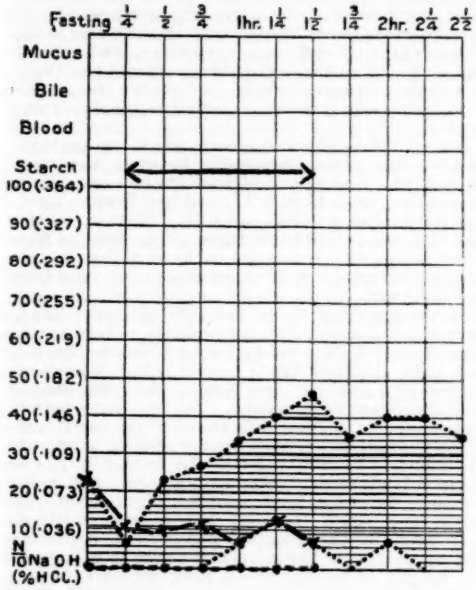
The mechanism of *hyperchlorhydria* in health has already been discussed. There is no essential difference in its mechanism in disease, excepting that the causal factors—namely, hypertonus and hypermotility—are exaggerated, and that there is reason to suppose that in certain conditions a positive hypersecretion may occur. In *hypersecretion*, which is an accompaniment of duodenal or præ-pyloric ulcer, there is a very copious, clear, and highly acid resting juice with continued secretion after the conclusion of the test-meal. According to Bolton,[25] however, the only indisputable evidence of hypersecretion is a "rapid rise in the total chloride curve, with or without a similar rise in the HCl curve in the early stage of digestion when the stomach is full, provided the organ is not emptying rapidly."

Hypochlorhydria and achlorhydria in disease are due to (1) excessive neutralisation consequent upon abnormal patency of the pylorus or the presence of a gastro-jejunostomy; (2) neutralisation by the alkaline and albuminous exudates from the surface of a malignant growth; and (3) neutralisation and inhibition of acid secretion by an excessive output of mucus, as in gastritis.

Complete achylia or absence of secretion has by some been presumed to depend upon atrophy of the gastric glands. Faber regards it as a result of pathological changes consequent upon past gastritis. Hurst,[27] as also did Martius,[28] regards it as an inborn error of function, and considers that gastritis is more often secondary to achylia than achylia to gastritis. The discovery of achylia in a small percentage of healthy men and in the healthy members of families with a history of Addison's anæmia supports Hurst's view. I have formed the impression from a few case-histories that scarlet fever which, as Brinton[1] showed, is capable of producing a very severe desquamative gastritis, may be a cause of subsequent achylia. One of the four healthy men with achylia in Bennett and Ryle's series was found on subsequent inquiry to have had scarlet fever in childhood followed by a slight persistent albuminuria.

There are no constant distinguishing features in the ordinary test-meal curves between a secondary achlorhydria and a primary achylia. In primary achylia there is a very narrow interval and close parallelism between the curve of total acidity and the base line (vide Chart 10), and the condition persists after lavage. A wide interval between the curve of total acidity and the base line and a lack of parallelism is more likely to occur in a secondary achlorhydria, and is best seen in cases of obstructive carcinoma. The presence of blood strongly favours a diagnosis of carcinoma. In gastritis the presence of mucus in large quantities is an accompaniment of the achlorhydria and the fasting specimen may have a peculiar rancid odour; normal curves may be obtained after lavage and treatment. A comparison of Charts 10, 11 and 12, from cases of Addison's anæmia, leather-bottle stomach, and gastritis with acne rosacea will show that no diagnosis can be based on a simple study of the chart of acidity alone. Lacking other evidence, a repetition of the test-meal after lavage and chloride estimations may be necessary to distinguish between an achylia and a secondary achlorhydria.

CHART 11.

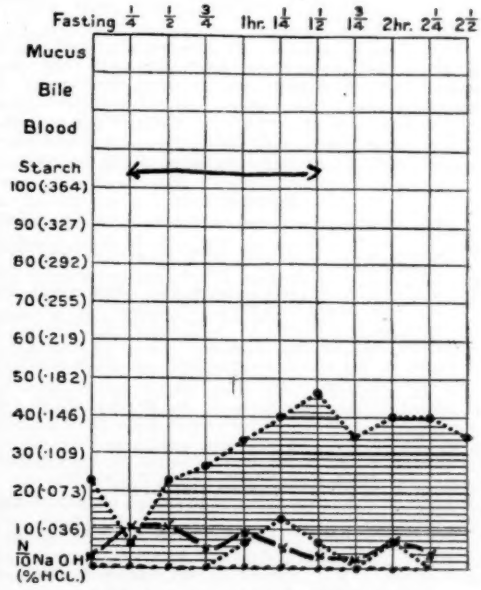


Achlorhydria. Leather-bottle stomach.

Achlorhydria and achylia are encountered with greater frequency than in health in a variety of general diseases. In Addison's anæmia, with which subacute combined degeneration of the cord is included by Hurst and Bell,[29] it is a constant finding. Reference to Bell's series gives an idea of the increased incidence of achlorhydria in certain general and local conditions, including multiple infective arthritis, appendicitis, and gall-stones. Others have reported its frequent occurrence in pellagra and sprue and gout. In some of these conditions, but particularly in Addison's anæmia and in gastrogenous diarrhœa, recognition of the achylia or achlorhydria is of more than academic interest, for it calls for the therapeutic administration of hydrochloric acid.

Hunter,[30] employing the fractional test-meal and examining 174 cases of gastro-intestinal disease (in which the diagnosis was confirmed at operation or by biopsy, autopsy, or indisputable clinical evidence), found that in chronic duodenal ulcer 88 per cent. of the cases showed curves above the limits of normal; in ulcer at the pyloric end of the stomach, 67 per cent. of the curves were above the limits of normal; in chronic ulcer of the body of the stomach 50 per cent. of the curves were within normal limits, while 35 per cent. rose above these limits. In cases of hour-glass stomach there was hypochlorhydria; in hour-glass stomach complicated by pyloric stenosis there was usually hyperchlorhydria. In cases of carcinoma of the stomach 67 per cent. showed complete achlorhydria, while 32 per cent. of the curves were within or above the limits of normal. In visceroptosis there was achlorhydria in 70 per cent. of cases.

CHART 12.



Achlorhydria. Gastritis with acne rosacea.

Reviewing the conclusions of the foregoing sections we find that most pronounced variations in acidity can be related to disturbances in the function of the

pylorus with which the pars pylorica should probably be included. The exceptions to this generalisation are (1) primary achylia; (2) secondary achlorhydria from disease involving the mucous membrane itself; and (3) the reflex hypersecretion which accompanies some cases of duodenal and præpyloric ulcer.

There is no longer any justification for the employment of "hyperchlorhydria" and "achlorhydria" in a diagnostic sense. The majority of dyspeptic cases which would formerly have been diagnosed as "hyperchlorhydria" are now shown to have either a duodenal ulcer or some other organic irritative lesion. The majority of cases showing achlorhydria are found to be suffering from pyloric insufficiency with gastric hypotonus due to general causes; from local diseases such as gastritis or carcinoma involving the gastric mucous membrane; or from general diseases such as Addison's anæmia.

SUMMARY.

1. The nature and probable causes of the common gastric symptoms have been discussed and evidence for their dependence upon an exaggeration or inhibition of normal tonus, peristalsis, or motility has been given. Whereas pain and discomfort are probably associated with an increase of tension in the muscle-fibre, it is suggested that anorexia (other than that due to rigidity of the stomach wall) and nausea are associated with abnormal relaxations of the muscle-fibre.

2. The common derangements of motor function and the methods of studying them have been briefly reviewed. Motility (or emptying-rate) and the factors disturbing it are more completely and accurately studied with the gastric tube than by other methods.

3. Although actual hypersecretion and hyposecretion of the gastric hydrochloric acid may occur under certain conditions, reasons are given for supposing that pathological hyperchlorhydria, hypochlorhydria, and achlorhydria generally depend upon motor disturbances influencing in one direction or another the rate at which neutralisation occurs.

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THE DIAGNOSIS OF MALIGNANT DISEASE OF THE THYROID.

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THE whole subject of carcinoma of the thyroid presents so many curious anomalies that no certain statements can be made which are true for all varieties. It is often stated that the disease is so malignant that once the diagnosis can be definitely made the prognosis is hopeless; but in more recent work there has been a tendency, in the statistics at least, to show that the outlook is quite good. These diverse statements are clearly due to the inclusion of several very different conditions, and, therefore, before it is in any way possible to discuss the diagnosis it will be necessary briefly to consider the frequency of the disease and the various pathological and clinical types.

Malignant goitre is usually found in patients of middle age, most frequently between the ages of 40 and 50. The youngest patients in my series were two males, aged 21 and 37, and one female, aged 34. The oldest was a female aged 79. Most investigators find that the condition is twice as common in females as in males, this being the ratio in Wilson's series.[13] In my own group of 13 cases there were nine females and four males.

In the majority of my cases the diagnosis has been proved by microscopic examination; two have not been operated upon owing to the advanced condition, but both of these have pursued the characteristic course of advanced carcinoma, and the diagnosis, therefore, can be accepted. In the same period of time there have been 402 cases of innocent tumour of the thyroid which have been subjected to operation. Thus in this operative series the frequency has been about 3·2 per cent. There are, however, not included in these figures a large number of cases of colloid goitre and small localised adenomata which have been seen in the hospital out-patient department, and of which—unless a special series is observed for the results of treatment—I keep no private notes; hence the frequency in the total number of cases is probably somewhere about half of this figure—i.e., 1·6 per cent. It is in this question of frequency that such varying figures are found in the literature. Balfour[1] found 103 cases of carcinoma in 6359 of goitre, a percentage of 1·6, whereas Speese and Brown[11] found the frequency as high as 4·6 per cent. They believe that this difference may be accounted for owing to the fact that their cases came from a non-goitrous region, whereas Balfour's were obtained from an endemic goitrous area. Wilson,[13] in his investigations, found that the incidence of malignant disease was as high as 1 in 15.

Difficulties of Diagnosis and Classification.

In my own experience the morphological characters, whether micro- or macro-scopic, have been of little or no help in determining the clinical course of the disease or in estimating the measure of its malignancy. Pemberton's[8] classification into sarcoma, carcinoma, malignant adenoma, and malignant papilloma, although of pathological interest, is of little use, for these different varieties do not give rise to constant clinical types. Of two of my cases showing very similar enlargements of the thyroid, and both described as "mixed-celled carcinoma," one died of extensive recurrence after five months, whilst the other, although developing a local recurrence which was treated with X rays, is alive and well over three years after the operation. De Quervain[5] has also laid stress upon these difficulties, and he states that the term "malignant goitre" must still be used because it is impossible to differentiate the varying histological types clinically; indeed, it is not possible to distinguish cancer from sarcoma. With the latter part of his statement all will agree, and indeed this subject presents enormous difficulties even to the pure

pathologist, for, as Wilson has pointed out, the sarcomata are peculiar in that besides the connective-tissue elements, of which any form of sarcoma may predominate, there are almost invariably present large or small groups of parenchymatous cells which are also proliferating. He states that it is therefore difficult to say whether the original tumour was formed of proliferating carcinoma cells with a later growth of the connective-tissue elements, or whether the connective-tissue change was primary and there was a secondary stimulation of the parenchymatous cells. At the London Hospital all these mixed cases are reported as "carcinoma sarcomatoides," of which there were four in my own series. To my mind, the almost constant appearance of the carcinoma cells in the cases of sarcoma is a strong argument in favour of the view that these tumours arise from groups of embryonic cells, for in their growth such cells might be expected to differentiate along the connective tissue or epithelial cell path, or even along both.

The difficulties are increased by the fact that many lesions of the thyroid which ultimately pursue a clinical course that is clearly innocent show a microscopic picture which would be passed as malignant. The close simulation that microscopic sections of some cases of exophthalmic goitre show to carcinoma is well known, and in one of my cases (No. 1A) such a diagnosis was made because the cells had spread widely into the lymphatics. The appearance of the thyroid clinically and at operation also suggested this diagnosis, but the subsequent progress has given no evidence of the presence of any carcinomatous change, and I doubt very much, therefore, whether I ought to have included this case in the list of carcinomata. The difficulties that have arisen in the cases of the proliferating goitre of Langhans or the toxic adenoma of Plummer, and to which attention will later have to be given, are also well known. For these reasons, then, any pathological classification must in the present state of our knowledge be regarded as unsatisfactory, and resource will have to be made to a clinical grouping.

Clinical Varieties.

In my own cases three quite distinct clinical varieties can be recognised: (1) Those occurring secondary to adenoma or a colloid enlargement; (2) those which are apparently carcinomatous from the onset; (3) those showing a slowly-growing primary lesion with large secondary deposits. In such cases the primary lesion is frequently overlooked.

Cases Occurring Secondary to an Adenoma or Colloid Enlargement.

In my own series there were five such cases, four being females and one a male. The presence of such a group has long been recognised, but very different figures have been given as to the frequency of any previous lesion. Speese and Brown, in their careful investigation of 25 cases of carcinoma and three of sarcoma, found that there had been a previous adenoma or colloid goitre in 78·5 per cent. of the cases, and the average time at which a simple lesion had been present before the onset of malignancy was $12^{6}/_{10}$ years. Wilson,[13] Plummer,[9] and Balfour[1] believe that the association of malignant disease with a previous benign lesion is almost invariable, and Berry [2] has shown that a careful examination will often reveal the presence of some evidence of previous disease. Chambers [4] states, however, that taking into consideration the slow growth of some cases of carcinoma it is possible that in many instances the condition is rather one of continuous slow development of a malignant goitre than of malignant disease superimposed on a benign growth.

My own cases in this group all show, as will be seen by the table, a prolonged period ranging from 2½–35 years in which a tumour having only benign characters had been recognised, and it is not possible to believe that over such long periods the tumour was already malignant. It is in this group that the first evidence of malignancy is often shown by the presence of some hyperthyroidism, due to a cellular proliferation within the capsule of the gland, and I believe that too much stress cannot be laid upon the work of Plummer and Wilson in this respect. The latter [14] found that of 97 cases who had died of the disease or who had had recurrence after operation in the Mayo Clinic, there were 50 whose clinical history before the first operation contained no suggestion of malignancy, and 23 of these thyroids were even passed by a pathologist without suspicion of malignancy. He believes that the first evidence of proliferation is hypermetabolism with cardiac disturbances—the toxic adenoma of Plummer. If the proliferation continues it penetrates the capsule, invades and metastasises, and is then frankly malignant. Histologically, it may be impossible to distinguish the fœtal adenoma from carcinoma. Hence he states that any sizable adenoma composed of embryonal tissue, if in a patient of cancer age, is potentially malignant. With this my own experience agrees, and I would therefore regard the onset of hyperthyroidism in any adenoma as a strong piece of evidence of the onset of carcinoma, and would advocate early operation in any such case. Later, when the cells break through the capsule, more definite evidence of carcinoma arises, but it is interesting to note that for a time such cases are relatively slow in their progress, and hence the prognosis may be still quite good.

Usually the first evidence of such change is a more rapid growth of the localised nodule, but the mere presence of such a change must not in itself be taken as definite evidence of carcinoma. There are a considerable number of other conditions which will give rise to such a rapid increase. Perhaps the most frequent of these is the presence of an intracystic hæmorrhage, and the fact that this may cause a rapid enlargement and a sudden increase in the dyspnœa is well known. The enlargement due to a hæmorrhage is often, however, much more sudden than that due to the onset of carcinoma, although the rate of increase will naturally depend upon the amount of bleeding. More suggestive of carcinoma is the rapid increase in size which occurs with an inflammatory change. This will give rise to considerable difficulty in the diagnosis, for not only is the mass increased in size but its outline becomes more ill-defined, and it may become firmly adherent to the trachea and sometimes even to the surrounding structures. Its outline, however, is as a rule less nodular than in the case of a carcinoma. Another difficulty may arise owing to the fact that some of the tumours which have undergone a definite carcinomatous degeneration may not always show a rapid onset in the growth. Wilson [13] found that such an increased rate of growth was only present in one-third of the cases, whereas another one-third had noticed symptoms of continuous growth for ten years or more, and even of those that were inoperable at the time of their examination one-quarter had noticed symptoms which might have been interpreted as indications of the presence of malignancy for ten years or more.

An important change which is usually seen at the same time as the increase in size is an irregularity of the outline and a firmer consistency of the mass. Similar changes may be seen in an adenoma which has been cystic and calcareous, but unless there be coincident inflammation there will not be the same measure of fixation. A rapid increase in size due to inflammation or hæmorrhage may be equally hard but will rarely be so nodular. It must also be remembered that an adenoma in a patient who has become pregnant not infrequently becomes larger and considerably harder, and hence may be mistaken for a carcinomatous change. As a general rule no operation should be performed for goitre on a pregnant patient if it can possibly be avoided. In all the above conditions there is rarely the same irregularity, the presence of which is distinctly suggestive of the onset of carcinoma. Care must, however, be taken not to mistake one large adenoma with several small outlying adenomatous patches for the irregularity of one neoplastic mass.

TABLE I.

Name.	Date.	Sex and age.	Swelling.	Progressive symptoms.	(*a*) Hypr. thy. (*b*) Condition of thyroid.	Pressure symptoms.	(*a*) Fixation. (*b*) Dilated vessels.	(*a*) Lymph glands. (*b*) Secondaries.	Condition at first operation.	First operation.	Pathological report.	(*a*) After progress. (*b*) After treatment.
A1 L. S.	26/10/14	F 34	4 yrs.	Pressure and inconvenience 6 mths.	(*a*) Nil. (*b*) Diffuse swelling.	Slight.	(*a*, *b*) Nil.	(*a*, *b*) Nil.	28/10/14: Colloid shape, very hard.	Double V-resection.	Carcinoma.	(*a*) Thyroid very large and hard for 2 weeks. Hypothyroidism after 5 weeks. (*b*) Thyroid extract after 6 weeks.
A2 E. T.	14/9/14	M 42	6 yrs.	Increase in size and pressure 1 yr.	(*a*) Marked. (*b*) Diffuse enlargement.	Nil.	,,	,,	16/9/14: Diffuse enlargement like Graves's.	Removal of right lobe and isthmus.	Acinar, papillary, cystic, cylindrical, cubical, giant-celled carc.	(*a*) Steady improvement in 1 yr.
A3 G. R.	25/10/21	F 46	5 yrs.	Rapid increase 6 mths., dysphagia, dyspnœa.	(*a*) Nil. (*b*) Large swelling right lobe and isthmus.	Dyspnœa, dysphagia, alteration in voice.	(*a*) Complete trachea. (*b*) Veins.	(*a*) 1 right sup. clav. (*b*) Nil.	26/10/21: Right lobe and isthmus and glands enlarged.	Removal of right lobe and isthmus, right supraclavicular glands.	Solid mixed-celled carc. Secondaries in gland.	(*a*) Good immediate recovery. 3 mths. later 1 large gland high up right side. (*b*) Given X rays.
A4 H. S.	4/10/22	F 69	2½ yrs.	Severe pain 10 mths. Dyspnœa and dysphagia.	(*a*) Moderate. (*b*) Firm, hard mass right side, irregular.	Dyspnœa, dysphagia.	(*a*) To deep structures. (*b*) Nil.	(*a*) Several right. (*b*) Nil.	6/10/22: Large, hard, nodular mass right lobe, not infiltrating.	Right hemithyroidectomy.	Solid tubular carc. or thyroid.	(*a*) Good immediate recovery. Quite free 2 yrs. after operation.
A5 M. A.	21/6/17	F 67	35 yrs., right side	Left swelling 3 mths. Pain and dyspnœa.	(*a*) Moderate. (*b*) Large irregular masses, left, very big.	Much dyspnœa.	(*a*) Nil. (*b*) Left side and upper thorax.	(*a*, *b*) Nil.	24/6/17: Trachea displaced to right. Left lobe very large, adherent to sheath and muscles.	Left hemithyroidectomy.	Carc. sarcomatoides. Multienucleated cells and many mitoses.	(*a*) Good immediate recovery.

TABLE II.

B1 A. S.	8/11/14	M 21	6 mths.	Change in voice 2 months. Dyspnœa.	(*a*) Nil. (*b*) Enlargement left lobe, nodular.	Dyspnœa.	(*a*, *b*) Nil.	(*a*, *b*) Nil.	13/11/14: Ill-defined mass right lobe. ? Adenoma.	V-resection unilateral.	Solid acinar, trabecular, and papillary cystic carc.	(*a*) Good immediate progress.
B2 L. T.	20/4/15	F 48	1 yr.	Increase in size and pain 1 mth.	(*a*) Nil. (*b*) Localised swelling right lobe.	Change of voice.	(*a*) Present. (*b*) Nil.	,, ,,	21/4/15: Diffuse enlargement. Adherent to trachea and muscles. 6/9/16	Right hemithyroidectomy.	Medullary carc. chronically inflamed in thyroid.	(*a*) Uninterrupted recovery. (*b*) No further treatment.
B3 F. F.	5/9/16	F 44	10 mths.	Rapid growth since onset. Difficulty in swallowing. Loss of weight.	(*a*) Nil. (*b*) Large, soft mass right. Skin red and injected.	Great pressure on œsophagus.	(*a*) Absolute. (*b*) Whole area red and injected.	,,		Gastrostomy.	Nil.	(*a*) Died 2 days later.
B4 W. B.	31/12/17	M 64	6 wks.	Swelling in neck, steady progress since onset.	(*a*) Nil. (*b*) Rounded swelling in isthmus.	Nil.	(*a*) To trachea. (*b*) Nil.	,,	3/1/18: Mass in isthmus, adherent to trachea.	Isthmus incised, dissected off trachea.	Mixed-celled scirrhous carc. sarcomatoides.	(*a*) Local recurrence, April, 1918. Died August, 1918.
B5 H. S.	1/5/19	F 55	9–10 mths.	Swelling in neck, steady progress. Pain 5 mths.	(*a*) Nil. (*b*) Hard mass, right lobe. Displacement of carotid.	Dyspnœa, dysphagia, aphonia.	(*a*) To trachea. (*b*) Nil.	,,	8/6/19: Right lobe enlarged and fixed.	Wide dissection. Removal down to mucosa and pharynx.	Solid diffuse, mixed-celled carc. sarcomatoides.	(*a*) Good immediate recovery. Pain and dysphagia after 3 mths. Local induration. Later dyspnœa.
B6 M. S.	2/6/21	F 79	2 wks.	Swelling in neck, steady progress. Pain.	(*a*) Nil. (*b*) Hard mass, right lobe.	Some dyspnœa.	(*a*) Firmly to trachea. (*b*) Nil.	,,	2/6/21: Advised X rays.	—	—	—
B7 P. R.	5/6/23	F 61	3 wks.	Swelling in neck, right side. Steady progress.	(*a*) Nil. (*b*) Enlarged, hard, nodular right side.	Some dyspnœa. Voice hoarse.	(*a*) Absolutely to trachea. (*b*) Nil.	(*a*) 3 left side. (*b*) Gland only.	X ray not advised (Dr. Jupe)	—	—	(*a*) Steadily progressed. Rapid increase of glandular involvement.

TABLE III.

C1 C. M.	8/8/22	M 38	4 yrs. Swelling in front of left ear. Removed elsewhere.	2 years' recurrence of lump in front of ear. 18 mths. swelling below right clavicle.	(*a*) Nil. (*b*) Nil abnormal found.	Nil.	(*a*, *b*) Nil.	(*a*) Nil. (*b*) In front left ear, below right clavicle.	10/8/22: Apparently sarcomatous masses in front of ear and in right pectoralis.	Masses dissected out.	Secondary carc. sarcomatoides. ? primary of thyroid.	(*a*) Good immediate progress. Recurrence in glands of axilla after 1 year. (*b*) Given X rays.

An early and suggestive symptom is the presence of pain. Radiating and neuralgic pain passing from the lobe of the thyroid up the corresponding side of the neck to the back of the head is in most cases due to the presence of carcinoma. It may, however, occur when a fairly acute inflammatory change has taken place in the thyroid. If it be due to a sudden increase of tension, such as occurs with hæmorrhage, the pain is much more likely to be localised to the site of the swelling. With the onset of pain the mass will become fixed. It is important to remember that a simple adenoma is freely movable both upon the trachea and the surrounding tissues. If it has become carcinomatous it usually first becomes fixed to the trachea, and may be definitely malignant although it is still freely movable on the surrounding tissues. Stress is not sufficiently often laid upon this fact, and fixation to the trachea is often regarded as a character of all thyroid tumours. Care must therefore be taken in the examination to fix the trachea and to estimate the mobility of the mass upon it. With the continued spread of the growth beyond its capsule the next structures to be involved are, as a rule, the pretracheal muscles; as these become infiltrated there will clinically be a further amount of fixation and the nodular appearance on the surface will become much more evident. A distinct increase of pressure upon surrounding structures giving rise to dyspnœa, dysphagia, hoarseness and coughing, or clear evidence of interference with the recurrent laryngeal nerves, are all suggestive, but, as with the other symptoms, any one of these alone must not be taken as clearly indicative of carcinoma. It used frequently to be stated that a paralysis of one side of the larynx was diagnostic of carcinoma. It is now known, however, that a simple adenoma may project posteriorly and interfere sufficiently with the recurrent laryngeal nerve to cause a similar weakness of that side of the larynx. It is rather on the presence of several of these physical signs than of one alone that a diagnosis of carcinoma will be made. In the later stage infiltration of the skin, with redness, marked dilatation of the veins, and the presence of blood-stained sputum will make the diagnosis evident. Enlargement of the lymphatic glands is also suggestive but is not certain evidence of carcinoma, for an inflammatory lesion may also cause glandular enlargement. The nature of the enlargement is of more importance. In the former case the glands are harder and more sharply defined unless the carcinoma has broken through them and involved the surrounding tissues. These changes are usually quite distinct from the softer and more tender enlargement which is inflammatory in nature. The presence of such glandular enlargement may be found relatively early, and is thus not in itself a necessary counter-indication to operation.

The difficulties of making a diagnosis in the early stages are perhaps less in this than in the other groups, but are very considerable. The presence of a certain amount of hyperthyroidism I would regard as of great import, for even if it is not due to the actual onset of carcinoma it will give rise in time to severe toxic changes, and thus is an indication for operation even in elderly and feeble patients. It was present in three of the five of my cases in this group. Of the other symptoms rapid growth, increased hardness, irregularity, and tracheal fixation may all occur early, and although each one alone may occur with other conditions the presence of two or more are very suggestive. If operation be performed in these earlier stages the prognosis is not so absolutely hopeless as it is often thought. Of my five cases the first, which perhaps should not be included, has developed myxœdema but is alive and otherwise well ten years after operation; the second is quite well seven years after operation; one had a recurrence which has been kept under control and has indeed decreased in size with X rays, the patient being alive and feeling in perfect health three years after operation; the fourth is free of any evidence of recurrence two years after operation, and the fifth died with evidence of recurrence a few months after operation. (Table I.)

Cases which are Apparently Carcinomatous from the Onset.

This group in my series was slightly more common than the last, there being seven such cases, five females and one a male. In nearly every case the first symptom noticed was a swelling in the neck which rapidly grew and within a short time of the onset was associated with pain or the onset of pressure symptoms. Porter [10] states that as a rule this variety occurs in people beyond middle life, usually as a unilateral and less frequently as a bilateral goitre, and grows steadily or rapidly. It will be seen, however, that in my series one of the patients was only 21 at the time of onset, although the majority were over the age of 40. The longest history that was obtained was of one year, and in this case (No. B2) the growth was relatively benign in that even at the end of this period the tumour on clinical examination still appeared to be limited to the thyroid gland. It was, however, of special interest in that at operation it was not only adherent to the trachea but the whole of the right lobe was found to be involved and the growth had spread to the pretracheal muscles, so that these structures were infiltrated with a material resembling sago pudding in its consistency. Nevertheless, a wide removal of the right lobe and the overlying pre-tracheal muscles was followed by a rapid cure, and the patient has since remained free of all evidence of recurrence, a period of nine years. In three of the cases the tumour was limited to one lobe and showed the general appearance of an adenoma, but in all of these the mass was considerably harder than would have been expected if the lesion had only been an adenoma. In one it was nodular in outline and in the third it was adherent to the trachea—that is to say, in two of the three cases there was fairly definite evidence of carcinoma on clinical examination, so that the physical signs taken with the short history and rapid growth made the diagnosis probable. In the remaining cases the growth was more diffuse, a whole lobe or more of the gland being involved. It is in this group that a considerable amount of difficulty will be found in making a correct diagnosis, and this will chiefly lie in the direction of mistaking non-malignant conditions for carcinoma.

This variety of growth usually presents a short history, there is a diffuse enlargement of one lobe or more of the gland, the enlargement is hard, is often irregular and is fixed to the trachea. There is often a considerable amount of pain, probably owing to the rapid growth. The mass is not only fixed to the trachea but there may be a distinct amount of dyspnœa and often some difficulty in swallowing. Although these changes are very suggestive of carcinoma, I have had three such cases where a positive diagnosis of growth was made, but an operation was not advised either because of the patient's age or because the size and fixation to the trachea gave rise

LATER PROGRESS.

(*Continued from opposite page.*)

TABLE I.

A1.—Myxœdema ceased. Swelling rapidly disappeared. At end of year thyroid not felt. Still myxœdema controlled by extract. Diffuse alopecia after 2 years; improved. Still myxœdema after 7 years; controlled. Married, with 1 child.
A2.—After 7 years quite well.
A3.—Gradual improvement. Three years later quite well. Still small swelling upper border of thyroid.
A5.—Died of recurrence 4 months after operation.

TABLE II.

B1.—Well 8 months, then failed to report.
B2.—Perfectly well after 18 months. No recurrence since.
B5.—Operation low tracheotomy, 18/8/19. Died 5 weeks after second operation.
B6.—Died 6 months later of recurrences in lung.

TABLE III.

C1.—Some improvement in axillary swelling.

to the belief that the condition was too advanced for an operation to hold out a reasonable hope of cure. The after-progress of these cases has, however, been so slow or the condition has so definitely regressed that it is certain that there is no carcinomatous element. Unfortunately, in such cases the correct diagnosis remains a matter of conjecture, for no portion has been removed for section and it is only possible to believe that the enlargement was due to some inflammatory change.

It is always advised that in these cases a Wassermann test should be carried out, and there is no doubt that in all such doubtful cases it should be performed. I have, however, only once seen a definite case of syphilis of the thyroid. Here there was a localised swelling in every way resembling a simple adenoma, but owing to the strong syphilitic history a Wassermann test was performed and found to be positive, the lesion yielding to appropriate treatment. In not one of the doubtful cases was the test positive. In these inflammatory conditions the swelling is, as a rule, less sharply defined and not quite so hard and irregular.

In this group, as in the last, there is the onset of pain at an early date. At first limited to the site of the lesion, it soon begins to radiate more widely, and frequently passes up to the side of the neck, to the ear, and the side of the head, the patient frequently complaining of earache. Another point which I believe is frequently of value in making a positive diagnosis is that the carotid vessels may be pushed outwards, whereas it is more common in the innocent varieties for these structures to lie deep to the thyroid, which tends to expand forward as it grows. In the later stages the diagnosis becomes the more certain as the prognosis is more hopeless. Dyspnœa increases and there may be the expectoration of blood-stained mucus. Dysphagia is present and there is serious interference with the recurrent laryngeal nerve. The mass, and with it the trachea, becomes more firmly fixed as the growth invades the surrounding tissues. The lymphatic glands above and not infrequently in the posterior triangle become enlarged and hard, and later they in turn become fixed. The superficial veins are dilated and tortuous and the skin may become adherent and reddened.

The important difficulties in diagnosis, therefore, lie in the early stages when there is still some hope of bringing about a cure from surgical interference. In the localised group it may be said, as in the first variety, there is no one sign which is certain evidence of carcinoma. The short history, the steady growth, the hardness, and especially a nodular hardness which distinguishes this condition from a calcified adenoma, and a certain amount of fixation to the trachea will make a positive diagnosis almost certain. In my own experience any definite degree of hyperthyroidism has been absent in this group.

In the diffuse variety the difficulties are much greater, but fortunately the tendency is rather to mistake innocent lesions for carcinoma rather than carcinoma for inflammatory changes, but here again the combination of the short history, the steady progress, the hard mass, and the nodular surface are the important factors. In neither case do I believe that the local removal of a small portion of the growth will be of any value in arriving at a diagnosis. So often both neoplastic and inflammatory changes are combined that the absence of carcinomatous changes in so small a portion would still leave the diagnosis in doubt. It must be remembered here that the younger and more healthy the patient the more readily will operation be advised in all doubtful cases. It is in old, feeble patients on whom any operation of this sort might be a grave danger that such care has to be exercised in excluding inflammatory esions from the diagnosis.

In this group, as in the other, the prognosis will depend upon the time at which operation is undertaken, but even here there is a great variation in the rate of growth. In one of my cases showing a small mass of only six weeks' duration recurrence took place four months after operation and death occurred four months after the recurrence, while another with a year's history was well nine years after operation. Of the seven cases three were inoperable when first seen, two died of recurrences within a few months, one was lost sight of after eight months when she was still apparently well, and one remained free of all trouble to date, nine years after operation. (Table II.)

Cases Showing a Slowly-Growing Primary Lesion with Large Secondary Deposits.

There is a curious variety of carcinoma of the thyroid in which the primary lesion is so slowly-growing or is so small that it is frequently overlooked entirely, and this even upon careful examination. Scattered throughout the literature are accounts of cases in which metastatic deposits have occurred, and these most frequently in the long bones. The patient has been subjected to an operation, very often an amputation, in the belief that the condition was one of primary sarcoma of bone, and after operation a microscopic examination revealed the fact that the tissue was apparently carcinoma of the thyroid gland. The most remarkable, perhaps, of these cases is that reported by Sir Frederic Eve,[7] which occurred at the London Hospital. This was the case of a woman who had a large pulsatile tumour in the upper end of the femur for which an amputation was performed at the hip-joint. At the time of the operation no lesion could be found in the thyroid gland, but some few months after the amputation the gland became enlarged. This enlargement had steadily but very slowly progressed so that at the time of the report, three years after the operation, the thyroid was considerably enlarged, but the patient was in perfect health. There are several points of interest in this group of cases. First, there is the fact that the secondary deposits are more common in the parietes, whereas usually the other varieties when advanced give rise to secondary deposits in the viscera and especially in the lungs. The other point of importance is that the primary growth is relatively benign and slowly growing. De Quervain has laid stress upon this and states that the mildest form of carcinoma of the thyroid is presented by those cases which look innocent but are associated with secondary deposits. In many of these cases the rate of progress is so slow and the metastases so limited in number—it is, in fact, very common to find only one such deposit in a bone—that it is not uncommonly possible to remove a secondary deposit and then to operate upon the condition in the thyroid with a very good chance of obtaining a radical cure. Unfortunately, in a certain number of these cases, even when a metastatic deposit has been removed and the diagnosis of its origin has been made certain by a microscopic examination, it is still impossible to operate upon the thyroid, for the primary lesion is so small that it cannot be discovered.

There occurred in my series only one example of this type of case. This was a male, aged 36, who four years before he was seen had developed a swelling in front of the left ear which had been removed elsewhere. For 18 months the swelling in front of the ear had recurred and a second swelling had developed below the right clavicle. The latter in its clinical characteristics suggested a sarcoma in the pectoralis major muscle. Both swellings were excised, the lower with a surrounding area of healthy muscle, the diagnosis of both masses being doubtful. On microscopic investigation it was found that they were formed of a secondary carcinoma sarcomatoides of the thyroid tissue type, but a most careful examination failed to reveal the presence of any lesion in the thyroid gland. There was no local swelling and no general enlargement. A year after operation he developed enlargements in the axillary glands for which X ray treatment was advocated. Shortly after this he developed dyspeptic symptoms which suggested that there might be secondary deposits in the liver, but no enlargement of that viscus has yet been

determined. With the use of X rays the condition is for the time being held in check and there is still no palpable enlargement of the thyroid gland.

These cases present extreme difficulties in diagnosis, but they are difficulties which are of very little practical importance, for even if the nature of the metastatic deposit is not recognised an operation is usually undertaken, and with so slowly growing a primary lesion and a single metastasis this should be regarded as correct treatment even if the condition were recognised. In every case where any change is manifest in the thyroid gland the affected lobe should also be excised. (Table III.)

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THE RENAL THRESHOLD FOR GLUCOSE

IN DIABETES ASSOCIATED WITH NEPHRITIS.*

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IT is frequently stated that in chronic nephritis the renal threshold for glucose is raised to a greater or lesser degree. Reference may be made to Bang (1913), Myers and Bailey (1916), and Todd (1923). The latter states that while the renal threshold in such cases is generally raised, it is not always so. During the investigation of a large number of diabetics with a view to establishing their correct insulin dosage, a certain number were found to be suffering from nephritis and diabetes, and observations were accordingly made to see what effect the renal lesion had on the excretion of sugar.

It will be seen that all the cases described below were of middle age or older, and that in all instances the renal lesion was of the chronic and azotæmic type. It will be seen from a study of the figures in individual cases that no evidence was present of increased nitrogen bodies in the blood as shown by the fact that all had a low blood-urea content, but it must be remembered that all these patients were on a reduced diet and a low nitrogen intake. All of them showed, however, a marked inability to concentrate urea, and furnish excellent examples of the fact that MacLean's urea-concentration test (MacLean, 1919) is an exceedingly delicate means of detecting faulty renal excretion.

It is to be noted that few of these cases showed any symptoms suggesting nephritis. The evidence for nephritis is in nearly every case given by a low urea-concentration figure in conjunction with the presence of protein and casts in the urine, and often a raised blood pressure, except in Case 5, where acute nephritis was present, and the urea-concentration figure normal.

Clinical Records.

The patient in the case here described was a male, aged 52, who had been invalided from the army in 1917 with nephritis, had been in receipt of a pension, and had been regularly attending medical boards since. He complained of shortness of breath, polyuria, and frequent swelling of feet. Pulse, irregular; heart enlarged ext: to N.L.; blood pressure 210 mm. Hg. Is a very thin man, looks much older than his years, nose and extremities cyanosed. Sugar was noticed in urine during a recent pension board, and he was sent into hospital for further investigation.

Condition on Admission.—At this time he was passing about 2·5 per cent. sugar on a full diet and was accordingly starved for four days. The sugar was diminished but was still present (1 per cent.) and he was put on a slowly increasing diet, as it appeared impossible to make the urine sugar-free by starvation. He was sent to the laboratory for further investigation, with results as follows.

It was found that on a 900 calorie diet, the blood-sugar was fairly constant at about 0·075 per cent., with a urinary sugar of about 1 per cent. The urine contained much "acetone." The sugar tolerance was investigated with the following results:—

	Per cent.
Resting blood-sugar	0·081
½ hour after 50 g. of glucose by mouth	0·162
1 ,, ,, ,, ,,	0·218
1½ hours ,, ,, ,,	0·237
2½ ,, ,, ,, ,,	0·150
3 ,, ,, ,, ,,	0·100
3½ ,, ,, ,, ,,	0·075

Urinary sugar 2½ hours after taking glucose was 7·7 per cent. Urinary sugar secreted between 3 and 3½ hours after taking glucose, when blood-sugar was between 0·100 per cent. and 0·075 per cent., was 5·15 per cent. He was therefore put on a full diet, acetone bodies quickly disappeared from the urine, and the patient felt much better. The ammonia coefficient on a full diet was normal, it became slowly higher as the food intake was reduced. It was found that when he was on a full diet the urinary sugar was fairly constant at about 2·5 per cent., the blood-sugar being about 0·150 per cent.

At this period the renal function was investigated with results as follows:—

Urine, a thick cloud of protein, a few leucocytes present, no casts seen. The urea-concentration test gave a figure of 1·45 per cent. in the second hour. His blood-urea was 33 mg. Thus his urea-concentration was poor, while the blood-urea was normal.

After having been for some period on a full diet, he was submitted to absolute starvation with the exception of water to drink, to find at what level of blood-sugar his urine became sugar-free.

The patient was starved for 106 hours, frequent estimations of blood and urinary sugar being made. The urinary and blood-sugar gradually diminished until at the end of this time the blood-sugar was reduced to the low figure of 0·075 per cent., and even then he was still passing 0·9 per cent. sugar in the urine. By this time the urine reacted very strongly to Rothera's test, and as his condition was rather feeble it was not considered advisable to continue the starvation. It was found that for the first 85 hours of starvation the blood-sugar was constant at about 0·088 per cent., when he was excreting as much as 2·5 per cent. of sugar in the urine; later it slowly fell, as did the urinary sugar to the levels mentioned above.

The effect of a dose of lævulose was next tried, with results as follows. His weight was 10 st.

Thirty-five g. of lævulose were given dissolved in 100 c.cm. of water five hours after last meal, which consisted of two eggs, bread and butter, and tea. Blood-sugar before lævulose, 0·125 per cent.; 30 min. later, 0·168 per cent.; 60 min. later, 0·112 per cent.; 100 min. later, 0·156 per cent.; 130 min. later, 0·202 per cent.. Urinary sugar before lævulose, 3·0 per cent.; after lævulose, 3·9 per cent.

It will be seen that after lævulose the blood-sugar rises during the first half-hour, then drops to below the initial figure before the lævulose was given, and then rises again. There was a slight increase in the urinary sugar.

The patient was again put on a full diet, and examination of the blood and urinary sugar gave the same figures as before—i.e., blood-sugar 0·120 per cent. to 0·130 per cent., and urinary sugar about 2·5 per cent. He was then given pil. codein. gr. ¼ b.d., to see if this had any effect in

* Being in part the substance of a thesis submitted for the degree of M.D. Cambridge.

decreasing the permeability of the kidney for sugar. Very little, if any, effect was noted, the amount of sugar remaining practically the same.

Commentary.

The interesting point about this case is the very low threshold for sugar in a patient with advanced renal disease. The threshold is, in fact, so low that even if he had no defect in sugar utilisation he would resemble a true diabetic, owing to the inability to store sugar consequent on the continuous loss through the kidneys. Inspection of his blood-sugar curve following ingestion of sugar appears to show that there is some slight defect of sugar utilisation present, also his normal blood-sugar on a full diet is definitely raised in spite of the continuous leak via the kidneys. This defect, however, appears to be slight, and not to need treatment. The patient himself feels much better on a full diet. In addition, the permeability of his kidneys for sugar is the reverse of what is said to be found in patients with advanced renal disease. Further instances of this condition will be quoted later. It should be noted that the blood-urea was not raised, in spite of the fact that the urea-concentration figures showed that the kidneys were seriously damaged, probably due to the low nitrogenous intake. Thus, this case shows an abnormally low renal threshold for sugar and severe nephritis. It also appears that he has a mild degree of diabetes. MacLean (1922) states in his book that this is a rare condition and quotes one case, but in it the renal threshold was only reduced to 0·140. Here the renal threshold for glucose is at the very low figure of about 0·075 or lower.

Details of Additional Cases.

For briefness particulars of the other cases examined are shown in the following table. All were cases with severe diabetes and chronic nephritis. They were all starved until their urine became sugar-free, constant examinations of the blood-sugar being made.

Case.	Age.	Urea-concentration test (per cent.).	Blood pressure (mm. Hg).	Urine.	Blood-sugar level at which patient was sugar-free (per cent.).	Blood-urea (mg. per 100 c.cm.).
2	54	1·5	200	Alb. + + +. Granular casts numerous.	0·212	44
3	62	0·9	186	Alb., trace. No casts.	0·255	66
4	51	2·0	190	Alb. + + +. Granular casts numerous.	0·184	33
5	67	2·0	186	Alb. +. Hyalo-granular casts (a few).	0·181	32
6	54	1·4	200	Alb. +. Granular casts numerous.	0·181	—
7	58	2·2	178	Alb., cloud. Hyalo-granular casts numerous.	0·172	—
8	58	1·65	190	Alb., cloud. No casts.	0·180	48
9	58	1·6	194	Alb. +. Hyaline casts (a few).	0·186	32
10	41	1·65	190	Alb. + + +. Hyaline casts numerous.	0·186	29

Methods Employed.

The blood-urea was estimated by MacLean's modification of Van Slyke's method (MacLean and De Wesselow (1918)).

Urea was estimated by the hypobromite method. The urea-concentration test was carried out in all cases first thing in the morning before the patient had had breakfast.

Urinary sugar was estimated by Bertrand's method.

Blood-sugar by MacLean's method (MacLean (1919)).

Total nitrogen in urine by Kjeldahl's method.

Ammonia nitrogen in urine by aspiration of air through a measured volume of urine plus sodium bicarbonate, into a measured volume of acid and subsequent titration.

Plasma bicarbonate was estimated by Van Slyke's method Van Slyke (1917)).

Conclusions.

In all, ten cases are described of diabetes associated with renal disease; in all there is present a marked inability to concentrate urea as judged by MacLean's urea-concentration test. In eight of these ten cases the renal threshold for glucose was normal, in spite of the inability of the kidney to concentrate urea. In two cases the renal threshold for glucose was raised, one case (Case 2) slightly, in the other (Case 3) to a greater extent.

It would appear, therefore, that chronic nephritis of the azotæmic type does not, in the majority of cases, alter the permeability of the kidney for glucose. In addition, these observations show that MacLean's urea-concentration test is of greater value in estimating the function of the kidney in diabetes than an estimation of the blood-urea, since the prolonged period during which many of the patients have been on a low diet tends to lower the blood-urea. It is, of course, well known that it is possible, in cases of nephritis, by giving a diet containing very little protein, to reduce the blood-urea, when previously on a full diet it had been very high, to an almost normal figure. Examples have been given in a previous paper (Wordley, 1920).

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INCIDENCE OF GLYCOSURIA DURING PREGNANCY.*

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THESE notes are based on the result of the examination of the urine of 548 patients during their pregnancy. The routine has been generally a monthly examination, supplemented (in those cases in which sugar or albumin was found) by more frequent tests. The total number of urine examinations was 1346, which gives a rough average of between two and three per patient. The specimen of urine examined has not been always the early morning fasting urine, for this would, as pointed out by Joslin, lead to some cases not being detected at all, sugar being present in the urine only after a meal in some patients.

The records date from 1908 to this year, therefore the majority of the cases were under observation before the modern test of the blood-sugar index was in use, and are in many of the cases, due to the exigencies of general practice, very imperfect.

As to the nature of the clinical material, most of the patients belonged to the rather better working classes of a manufacturing town, whose diet is on a more generous scale in the use of meat than in the purely agricultural districts. The cases included some with complications (see Table).

Method of Testing.—Boiling the Fehling solution freshly made in the test-tube and adding the urine, a few drops at a time, and keeping the mixture at boiling point till nearly as much urine as test solution had been used. Later the reaction has been carried out by boiling the test solution and urine separately, and mixing equal volumes, then boiling the mixture for five to ten seconds, and allowing the tube to stand

* Read before the Section of Obstetrics and Gynæcology of the Royal Society of Medicine.

and cool for about a minute. Positive results have been checked by the fermentation method, noting a diminished sp. gr., and again testing the filtered fermented urine for sugar by the same method and finding it absent.

Table showing Incidence of Glycosuria in Cases of Pregnancy with Complications.

Complication.	Total No. of cases.	Glycosuria— With.	Glycosuria— Without.	Remarks.
Eclampsia ..	1	—	1	Severe; 40 fits; recovered.
Acute alcoholism ..	1	—	1	Fatal; nearly full-time gestation.
Morbus cordis .	7	3	4	—
Syphilis	1	—	1	Second stage (untreated).
Chorea	1	—	1	—
Tuberculous disease of hip	1	—	1	Chronic discharging sinuses.
Mediastinal tumour ..	1	—	1	Secondary growths of suprarenals.
Simple fibrous goitre	2	1	1	—
Insanity	3	1	2	Morbus cordis in the case with glycosuria.
Uterine fibroids ..	4	3	1	—
Epilepsy	1	—	1	—
Pertussis	1	1	—	—
Tuberculous meningitis ..	1	1	—	Fatal at third month.
Intractable boils	2	2	—	One patient; two pregnancies.

Incidence of Sugar.

Of the 548 patients, 166 had, at some time or other, during pregnancy, sugar in the urine—that is, a little over 30 per cent.; 23 patients had sugar in the urine in more than one pregnancy, but not in all—that is, about 4 per cent.; 8 patients had it in all their recorded pregnancies—that is, nearly 1·5 per cent. Of the 166 detections of sugar, 40 were first noted before the 21st week of pregnancy, while 126 were first detected between the 21st and 40th weeks, the week showing the largest number being the 28th; the next two highest being the 22nd and 30th weeks.

With regard to the 40 cases that were showing sugar at a period of pregnancy not later than the 20th week (if we exclude one quite exceptional case in which the glycosuria was accompanied by pernicious vomiting, albuminuria, and abortion in all three pregnancies), in 24 cases (59 per cent.) it was definitely recorded to have disappeared before the end of the pregnancy; while of the 126 cases in which it was detected first at the 21st week and afterwards, only 34 cases (32 per cent.) are recorded as not showing sugar in the urine again.

Of the 40 early cases, if we exclude the exceptional case before mentioned, there is no record of toxæmia at all, while in the 126 later cases there were 4 with albumin as well, 2 had albumin in the next pregnancy, 1 had sugar still 13 years later, and 1 showed sugar still 10 years afterwards, and 10 had marked signs of toxæmia. One had chorea, and 3 tachycardia of doubtful origin.

It appears from these figures that about 30 per cent. of these pregnant women passed sugar in the urine at some time during their pregnancy, and in about one-third of all the cases and in quite one-half of those which were first detected before the fifth month it was of short duration, and not associated with other serious signs of disturbance of metabolism, while in those cases in which it appeared at about the 28th to 30th week it is more often associated with signs of toxæmia and more allied perhaps to the "renal diabetes" so-called, and in about 10 per cent. of them it lasted till labour and afterwards.

In the small proportion in which the sugar appears in every pregnancy (1·5 per cent.) the proportion of definite toxæmia is higher still, 50 per cent. at least, though the total number of these cases is perhaps too small to allow any conclusion to be reliable. In cases only first detected at a very late date—that is, after the 34th week—just under 3 per cent. of them had sugar till labour, and afterwards; some of these cases were of the intermittent type.

No special incidence of septic infection was noted in these patients, though it was the rule to record all vaginal discharges, or any septic condition which a complete examination revealed. The average weight at birth of the children of mothers who had glycosuria at any time during pregnancy was 7·2 lb. Sugar was absent in the fasting urine in most of my cases. As to the effect of diet, I found that, if strictly adhered to, it caused the disappearance of the sugar, thus differing from what is generally said to occur in "renal diabetes," and from most of the cases related by Dr. Mackenzie Wallis in his paper read before this Section in November, 1921; but his statement that the sugar is mostly detected about the sixth month, and as to the frequent occurrence of severe vomiting at an earlier period of the pregnancy, corresponds with my experience. In one particular case (No. 2) the result of dieting was disquieting, the urine when sugar-free becoming loaded with acetone, and the patient manifested symptoms of severe weakness and faintness. This appearance of acetone in the urine where there had been none before the dieting was begun, was noticed in the case described by Dr. Graham in his paper before this Section in May, 1924. But that was when the patient was at an early age, and before pregnancy had occurred.

Clinical Records.

CASE 1.—Mrs. —, aged 30; her second pregnancy. No history of first pregnancy. Sugar now present at 33rd week up to 5 gr. per oz.; blood pressure 155 mm. Hg; œdema of legs and troublesome pruritus; normal labour; hydramnios. Third pregnancy: now 37 years old; 31 weeks pregnant; urine containing sugar 5 gr. per oz.; it persisted till 14 days before labour, which was normal, except for hydramnios. This patient had amenorrhœa for four months with enlargement of thyroid and nervous symptoms just before the commencement of this last pregnancy; the thyroid enlargement and nervous signs disappeared with the onset of pregnancy; now, 10 years after, she has no glycosuria or thyroid enlargement, and is in good health and has regular periods.

CASE 2.—Mrs. —, primipara, aged 29; 23 weeks pregnant; sugar in urine (after meals only) 10 gr. per oz., no thirst or polyuria, but excessive frequency of micturition, sometimes half-hourly. Blood-sugar fasting 0·083, after 100 g. glucose, 0·136 after one hour, 0·104 after two hours, 0·079 after three hours. Taken when on ordinary diet at two hours after midday meal, 0·166. Had excessive vomiting and "air hunger" first two months—these symptoms now gone but has pain under right shoulder and in breasts if exposed to cold (it was mid-winter); these symptoms relieved by large doses of sodium bicarbonate. With strict non-carbohydrate diet, urine became sugar-free, but produced symptoms of giddiness and weakness and "drunken feeling" and large quantity of acetone appeared. Sugar reappeared directly carbohydrates were taken even in small quantity, and eventually some present in fasting urine as well; total amount being up to 400 gr. per diem. After premature labour (induced) sugar persisted for six weeks, then disappeared; three months after labour 50 g. glucose gave blood-sugar 0·18 three hours afterwards, and urine showed 9 gr. sugar per oz.

CASE 3.—Mrs. —. Three successive pregnancies: first pregnancy, aged 32; 11 weeks pregnant, seen because of intractable vomiting for 14 days. Pulse 100 (persistent); blood pressure 150–160 mm. Hg; scanty urine, high colour, excessive acid reaction, sugar, and trace albumin; ferric perchloride test positive. Vomiting ceased after one passage of stomach-tube and gastric lavage; urine increased in volume and contained more sugar; a fortnight later aborted spontaneously. Second pregnancy: about eight weeks pregnant; vomiting began a week ago and said to be continuous. Pulse 108, temp. normal. Urine as before but no sugar; volume very scanty. Improved under gastric lavage for a fortnight, and sugar appeared in urine, then relapsed. Blood pressure 120 mm. Hg; pulse up again; delirium at night; total urine 16 oz. per day only. Uterus emptied under anæsthetic and sugar absent from urine by 14th day. Third pregnancy: now aged 33; seen at eighth week, vomiting severely, no sugar but albumin. Seven days later sugar present. Still vomiting continuously; after 12 days, vomiting better, but patient certified for acute mania and removed to mental hospital; discharged in seven weeks recovered. Vomiting still

severe; sugar still present. Pulse persistently over 100; some night delirium; uterus emptied under anæsthetic; large quantity liq. amnii of dark green colour; no sugar in urine three days later. Now, nine years after, has had no more pregnancies, has become very fat, and has no sugar in urine, and periods are regular.

The Question of "Renal Diabetes."

It has been suggested that these cases were really cases of "renal diabetes" such as has been described apart from pregnancy—that is, sugar in the urine, with no hyperglycæmia or other diabetic signs. It appeared in two of my cases to be so—the sugar being still present 10 and 13 years afterwards, and yet the patients still in fair health, certainly not diabetic. In these, too, others of the same family had glycosuria.

In considering this question of renal diabetes and its importance, I mention the work of Barrengen and Roper[1] who, analysing insurance statistics, found that after five years 20 per cent. of their supposed "renal diabetics" had developed diabetes, 25 per cent. were "suspicious," and 55 per cent. remained free. They also noted that if the glycosuria was recurrent—that is, detected more than once—8 out of 11 cases became diabetic. These figures make one hesitate to say the matter is not important.

Types.—Perhaps there are at least two distinct types—first, a benign type, which is generally first noticed before the fifth month, but may only be detected very late in the pregnancy, viz., after the 34th week; this may be transient or intermittent, or may be a condition, unaccompanied by serious symptoms, which was present before the pregnancy, and will persist after it; and secondly, a type where the sugar generally appears at about the 21st to 23rd week, is often accompanied by symptoms usually associated with some toxæmia of pregnancy, and does not disappear till the termination of the pregnancy, and in some cases recurs with succeeding pregnancies. It is especially associated with cases having had severe early vomiting, which often has subsided, and also in the later months with œdema (not necessarily accompanied by albuminuria)—a link perhaps with chloride metabolism, and also sometimes associated with hydramnios.

In connexion with the supposed comparative innocency of glycosuria before the fifth month which I suggest as the result of my experience, it may be of interest to recall that in the early months of pregnancy the detection of sugar in the urine after a glucose meal has been used as a test for pregnancy (Frank and Nothmann). These writers assert that the test is useless after the fourth month, and if that is so, it seems that the normal pregnant woman can meet most demands after that period on her carbohydrate metabolism.

Though the glycosuria met with in pregnancy after the fifth month may have some relation to "renal diabetes" it does not seem to explain all the other cases (excluding of course true diabetics).

The two cases in my series in which sugar is still present in the urine 13 and 10 years after the pregnancy, although still in good health and showing no signs of true diabetes—did not when pregnant present symptoms complained of by the patients who rapidly ceased to pass sugar after labour and the puerperium—such symptoms as, namely, excessive early vomiting, pruritus, considerable œdema of legs without albuminuria, and the presence of hydramnios.

My only excuse for recording these crude figures and the deductions from them I have suggested, must be the present position of our knowledge of pregnancy and so-called "toxic" pregnancy. Recent work on the glands of internal secretion seems, at any rate for a time, to have increased the fog between our eyes and the clear picture we all desire of the relationship (if any) between pregnancy, "toxic" pregnancy, acidosis and carbohydrate metabolism, and otherwise, to each other. My hope is that by placing this fragment, as one may figuratively describe it, on the table where the parts of an, as yet, unarranged puzzle lie, I may help others to fill the gaps and so aid in its ultimate solution.

PS.—Since finishing these notes, I find that I have overlooked that Dr. Herbert French, quoting Saleim in the Goulstonian Lectures, 1908, gives the incidence of glycosuria in pregnancy as high as 66 per cent., and observes on the frequency of hydramnios in this condition; also a case recorded by Dr. R. Wise and published in the Transactions of this Section in March, 1923, in which death of the fœtus occurred at the eighth month of the first pregnancy, while in the second pregnancy the symptoms specially noted in addition to polyuria and thirst were pruritus and faintness, the sugar disappearing after a normal labour with living child. With reference to this tendency to death of the nearly mature fœtus before birth, I give very briefly notes of a case occurring to me within the last few weeks. A primipara, aged 35, sugar 2 gr. per oz. found at the 24th week. Hydramnios detected at the 28th week with great œdema of legs. Sudden death of child at 35th week, almost complete subsidence of the œdema and sugar before the birth of a 7½ lb. macerated fœtus at the 38th week.

[1] American Journal of Medicine, June, 1907.

Clinical and Laboratory Notes.

VERONAL POISONING.

WITH NOTES ON A CASE.

BY E. P. SCOTT, M.B., B.S. LOND., M.R.C.S. ENG.

IN patients with any cardio-renal affection veronal or other hypnotics must be given with caution, as their excretion must necessarily be delayed, and their accumulation considerably hastened. The following is an instance which came under my care some months ago.

I was called to see the patient (a woman aged 62) in consultation, and found her in a comatose state. She had been suffering from insomnia, the result of anxiety. The diagnosis lay between (1) cerebral hæmorrhage, (2) cerebral tumour, (3) diabetic coma, (4) uræmic coma, or (5) that associated with a drug toxæmia. The patient was well nourished with no obvious gross lesion. There was slight cyanosis; breathing stertorous, and inclined to be shallow; pulse 90, regular, full, and of high tension. There was some slight cardiac hypertrophy. The pupils were both widely dilated; no reaction to light; corneal reflex absent. Knee-jerks absent, and Babinski's sign present in one toe; no ankle clonus. Blood pressure approximately 200–120.

Diagnosis, therefore, rested largely on examination of the urine and blood. No previous history of illness was obtainable. The blood-sugar was 0·133 per cent.; urea 0·033 per cent. The urine was acid, contained 1/10th albumin, 2·5 per cent. urea, specific gravity 1026. Rothera's test was positive. Centrifuged deposit showed only very occasional hyaline casts. Further examination showed albumin varying from a faint trace to a definite cloud, while a week later Rothera's test was still positive and the ferric chloride test negative. A fortnight later Rothera's test was negative and ferric chloride positive. A fortnight later again both ferric chloride and Rothera's tests were negative. A drastic purge and hot packs were given. I also drew 25 oz. of blood from the right arm, and gradually the comatose condition began to subside. The reflexes gradually returned; movement returned to all limbs and body.

Onset of Ophthalmoplegia.—After 36 hours it was noticed that the patient had developed ophthalmoplegia, and hæmorrhages were observed in both eyes. Mr. Ernest Clarke, who saw the patient with me, has sent the following notes:—Jan. 25th: Some ophthalmoplegia still remaining in both eyes, pupils very sluggish and still dilated. The fundi of both eyes presented about the same appearance, viz., papillitis, swelling +3 in the right and +2 in the left œdema spreading from the discs, small streaky flame-shaped hæmorrhages. No sickness or vomiting, and no other symptoms pointing to cerebral tumour. Feb. 6th: General condition better, ophthalmoplegia disappeared, and there was a slight convergent strabismus of the right eye, and pupils were normal but sluggish; the appearance of fundi much the same, except that the swelling was about 0·5 D. less in both eyes. 24th: From this time the patient rapidly

improved. June 24th: Both fundi absolutely normal, vision with glasses 6/9. Sept. 23rd: Can now read part of 6/6 with glasses and J.5 *well*.

In course of time the reflexes became normal and the strabismus disappeared.

The condition, then, pointed to the effects of a drug which, owing to the probable presence of some cardio-renal affection, had exerted a powerful action on the nervous system. It has been noted that in cases of veronal poisoning, nuclear ophthalmoplegia is an occasional concomitant symptom. I therefore suggested that search should be made, and in one of the patient's boxes were found powders of veronal, each containing 7 gr. The patient's mental state improved, though slowly, and after several weeks she informed me that the night before she was taken ill the last thing she remembered was taking two of these powders (14 gr. in all) to give her sleep.

Dr. P. N. Panton, to whom I owe the pathological examination of specimens, thought it probable that the veronal may have been excreted as a carbamide, but it was impossible to determine this fact. I have examined the urine of patients who have taken medinal (a preparation allied to veronal), but have been unable to confirm the above. The patient has apparently recovered, after several weeks' nursing-home treatment. The blood pressure has dropped to 160, and her urine is normal.

I have recorded this case as Mr. Clarke considered the eye condition of great interest and undoubtedly due to the veronal.

Portland-place, W.

A CASE OF ENCEPHALO-MENINGOCELE.

BY EMILY G. STUART, M.B. LOND.,
OF QUETTA.

THE following case of encephalo-meningocele in an unusual situation seems worthy of record.

In October, 1923, I attended a Sindhi woman in her third confinement. She had had a normal pregnancy, and both previous children are alive and healthy. This third confinement was quite easy and short, though the patient complained that it was longer than her previous labours. The child, a girl, was born by vertex presentation, was well nourished and healthy, but had a fluid swelling growing from the nose, and covering the inner side of each eye; the nostrils could be seen below the lower border of the tumour; there was not any nasal discharge, and the baby could breathe through her nose. She could open her eyes slightly and could take the breast and move her limbs naturally. The tumour was lightly bandaged to save the mother's feelings, but on the third or fourth day it had grown larger and was covering the eyes more. I aspirated and drew off clear fluid, after which it was evident that about one-third of the swelling was of solid consistency. The swelling soon filled up again and the anterior fontanelle became prominent. I aspirated the swelling several times, at intervals of two or three days, and after aspiration the fontanelles became less prominent. The tumour was increasing in size in spite of aspiration, and after consultation with Dr. Holland, Major Haughton, I.M.S., and Captain Fry, I.M.S., it was decided to operate.

From photograph taken immediately before operation.

The *operation* was performed by Dr. Holland, assisted by Captain Fry, and after incision in the mid-line of the tumour the fluid escaped from a very thin-walled cyst. The sac wall could not be separated from the underlying tissues, so part of the wall was removed and an attempt was made to close the sac, the root of which came from inside the cranial cavity through an opening above the nasal bones. The optic thalami were found to be in the tissue removed. The thin outer skin was sewn up and dressings applied. After five days the wound opened up and fluid oozed through. The child gradually sank and became unconscious and died three weeks after the operation.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

NON-SPECIFIC DISTURBANCES OF HEALTH DUE TO VITAMIN DEFICIENCY.

THE resumed discussion[1] on this subject took place on March 23rd, the President of the Society, Sir STCLAIR THOMSON, occupying the chair.

The PRESIDENT, in a brief reintroduction, quoted a letter which the late Sir Clifford Allbutt wrote to the *Times* in his eighty-eighth year in criticism of the white bread usually sold, and calling public attention to the great value of vitamins in food.

The openers of the original debate, Dr. LEONARD WILLIAMS, Lieut.-Colonel R. MCCARRISON, Dr. W. CRAMER, and Dr. G. M. FINDLAY, briefly reminded the meeting of their contentions, the three last-named showing again the slides with which they supported their theses.

Dr. WILLIAM HUNTER said the very able opening by the four speakers had raised the subject beyond the region of mere hypothesis, for it was now clear that when vitamins were withheld from the diet the health of the animal suffered at once, and if this deficiency were continued over a long period actual disease, such as beri-beri, ensued. This lack certainly predisposed to infections of various kinds. He stressed the importance of the lymphopenia as a feature in cases in which there had been deficiency of vitamin B in the food, this vitamin having a direct influence on the blood-forming tissues. The bone changes which Dr. Findlay so well demonstrated were, Dr. Hunter said, identical with the aplastic marrow changes which he had so frequently found associated with what he termed aplastic anæmia, and as a cause of which he usually expected to find some streptococcal sepsis.

Dr. ROBERT HUTCHISON agreed with the discussion being limited to the three accessory food factors A, B, and C. It was contended, he said, that a deficient supply in the food of these specific vitamins was a cause of widespread disorders of health, and mainly the evidence brought was experimental. But it was very difficult to be sure that disturbances of health in animals fed on a vitamin-less diet were solely due to the absence of vitamins, as such diets were usually very abnormal in other respects also. Some were "synthetic" diets, others were deficient in proteins of high biological value, or in a proper balance of the inorganic salts. But granting, for the purposes of argument, that the disorders referred to were usually caused only by vitamin deficiency, was there reason for supposing that disorders comparable to those in the animals experimented upon were being produced by a similar cause in the community as a whole? This he doubted. If the contention of the openers were true, why did not more people show the final link in the chain? In 25 years' work at the London Hospital he had never seen a case of adult scurvy, nor one of beri-beri unless it had been imported from the East. The case of vitamin A, however, was somewhat different, as it was fairly clear that deficiency of this in the diet resulted in interference with growth and a lessened power to resist infections, though there was evidence that at the same time there was a shortage of calorie value in the food given during the growing years. He quoted with approval the following extract from "Food, Health and Growth," by the late Prof. Emmett Holt: "The physician can fall into no greater error than to assume that vitamin deficiency is the chief cause of all chronic nutritive disorders; just as not very long ago these were all referred to auto-intoxication . . . . The use of vitamins without definite indications will be popular for a period, but, like other fads, it will pass.

[1] THE LANCET, Feb. 21st, p. 385.

With time and further investigation their true place will be determined."

Dr. J. M. ROWLANDS spoke of his experiences in connexion with pigs on his own farm. He contended that one of the terminal events in the chain of vitamin deficiency was tuberculosis. He had been able to eliminate tuberculosis from herds of animals which previously had been very widely affected with that disease, and he had done it by feeding them on foods known to be rich in the three important vitamins. He held the strong belief that unless cows were fed on such diets, bovine tuberculosis would still be rampant among children, and would increase.

Dr. H. SCURFIELD contended emphatically that there existed plenty of evidence of widespread derangements of health which might be due to diets of deficient quality. It had been shown that intestinal stasis was one result of vitamin B deficiency, and practically the whole nation suffered from constipation. Also there was good reason for believing rickets to be due to defective diet. It was only reasonable to assume that infections could be warded off if the general dietary were improved in the respect alluded to. It had been shown that native races who lived on dairy products and fresh fruit and vegetables were remarkably free from the intestinal disorders which were so common in this country, and the same people were practically free from cancer.

Dr. F. PARKES WEBER said he had seen a good deal of evidence in the East End of London that the terminal link in the chain spoken of by Dr. Hutchison was reached; often it arrived in the form of tuberculosis, and in death from various acute infections. The bad cases were divisible into two classes: those with digestive disturbances, muco-membranous colitis, and visceroptosis, who all suffered from constipation. Secondly, there were those of corpulent body whose terminal stage took the form of cerebral hæmorrhage and arterio-sclerotic disturbances. These had taken excess of food, and perhaps a sufficiency of vitamin, but it had been their undoing.

Mr. ASLETT BALDWIN, referring to Dr. Hutchison's statement that he had never seen in his hospital practice beri-beri or scurvy, said the reason could probably be found in the fact that it would be difficult to find in London a person who was absolutely deprived of vitamins in his food; in that case one could not expect to see end-results which were typical and such as laboratory animals exhibited. He had had some gold fish for a number of years and he fed them on crumbs of whole-meal bread; friends of his who fed theirs on white bread crumbs soon lost them.

The PRESIDENT said that at Midhurst sanatorium as soon as the patients left the dining-room the sparrows flocked in at the windows, and he noticed that whereas they eagerly devoured any butter they could get, they never touched the margarine. It had, in fact, become necessary to cover up the butter after the meal was over.

Replies.

Lieut.-Colonel MCCARRISON, in a brief reply, said Dr. Scurfield's remark about cancer gave him the opportunity of stating clearly what was in his mind on that matter. What he had seen, and what he had said, was that cancer and chronic gastro-intestinal diseases were generally very uncommon amongst certain races in the extreme North of India, races whose diet was extremely well-balanced and rich in vitamins. He had not generalised on this subject because his experience did not go beyond those particular races. He believed it was not a question of civilisation *versus* want of civilisation, or of native races *versus* Western races. For instance, cancer was quite as common in the people of Bengal, whose food was very faulty, as it was now in this country. The important desideratum was that the food should be well-balanced and rich in vitamins and the other essential substances. In the present state of our knowledge—or ignorance—it would be as unwise to disregard the possible action which faulty food might have as a predisposing cause of gastro-intestinal cancer, as it was at present unwise to assert that faulty food was the cause of gastro-intestinal cancer. A recent report of the Medical Research Council stated that without vitamins normal metabolism was impossible. The Book of Ecclesiasticus said: "The Lord hath created medicines out of the earth; he that is wise will not abhor them." He, the speaker, knew no medicines created out of the earth on which normal metabolism was dependent with the exception of vitamins, and the wise man would not abhor vitamins.

Dr. CRAMER, in his reply, said he thought there should be further experiments from this standpoint on animals which were normally susceptible to tuberculosis. His answer to Dr. Hutchison's criticisms was that one could give the animals experimented on carbohydrates, proteins, inorganic salts, and other substances in due proportion, but if vitamins were omitted the animal died and showed specific lesions. But if animals so deprived were given a little butter, fat or yeast, a dramatic change came over the whole animal in two or three days. The terminal stages of this deficiency were not generally recognised, because they were called by the name of the particular disease from which the patient died, such as pneumonia, though the resistance to that disease had probably been fatally lowered by neglecting to give vitamins. And in some cases, though they had not enough vitamins in their food to keep them in the best health, they might yet have enough to ward off the terminal conditions. The mere fact that cases of beri-beri and xerophthalmia did not occur was no evidence that the people as a whole were taking food sufficiently rich in vitamins.

Dr. FINDLAY, in his reply, spoke of his investigation of an outbreak of pneumonia in an industrial school near Edinburgh. There had been previous outbreaks, and various hygienic improvements were introduced, but without checking the outbreaks. The diet was not thought to be at fault, as it was drawn up by Prof. Haldane. But the speaker found that, in order to save expense, the whole of the food for the boys was put into huge cauldrons, which were screwed down and the food stewed for three or four hours. In previous years there had also been conjunctivitis, which was not cured by applying disinfecting lotions. He recommended to the Scottish Office the giving of cod-liver oil and raw swede juice, and since that was carried out there had been no further outbreaks. In some experiments on animals he found that animals fed on food deficient in vitamins, particularly the A form, quickly caught and died from intercurrent infections.

SECTION OF ELECTRO-THERAPEUTICS.

TREATMENT OF CARCINOMA OF THE BREAST BY X RAYS.

A MEETING of this Section took place on March 20th, Dr. STANLEY MELVILLE, President, being in the chair.

The PRESIDENT, in opening the meeting, said the subject was one of great importance, especially at the present time, when, partly from within their ranks, but chiefly from outside it, attempts were being made to divide practitioners of electro-therapy into two camps, the old and the new. This threatened to be a danger to the whole question, and already surgeons were sending patients to electro-therapists with the stipulation that they were not to be treated by so-called "deep therapy." The speaker strongly deprecated such an attitude, as it was undesirable for those in the specialty to become slaves to any particular form of radiation. The researches of Prof. Russ and others, and the various experiments on animals, were an answer to those who said that treatment by the short wave-length was the only one of value. There could be no doubt that high voltage radiation was required, but equally the soft, long-wave radiation was needed. His own view was that too much thought was given to voltage and too little to the other factors.

Dr. GILBERT SCOTT then read a paper entitled

A *General Survey of Radiation*,

with special reference to treatment of carcimona of the breast by X rays.

He said he proposed to make a brief survey of the position from three points of view: that of the disease, the therapeutic agent, and the patient. With regard to the disease, he said that when the high voltage technique was published he thought it would prove a short cut to the object, the control of cancer. He particularly avoided using the word cure, when recurrences of so-called cured conditions came after as long as 22 years. A sufficient time had now elapsed since the introduction of the high voltage method for it to be realised that there was still a long way to go. Some said that cancer was a local condition. That might be true within narrow limits, seeing that it was first evident as a local lesion; but it was not safe to plan the attack upon it on this assumption. The surgeon only rarely saw early cases of cancer, the radiologist never. He considered that the development of the primary growth was merely a local indication that the patient had malignant disease; it gave no clue to the extent of such disease. Many schemes had been devised for giving a primary growth its lethal dose, but even when that had been done the patient succumbed in a short time to secondary deposits elsewhere, even though gland areas were irradiated also.

Considering next the therapeutic agent, X rays, he pointed out that the high voltage was a homogeneous technique, the low voltage was a heterogeneous irradiation. These two kinds could not be divorced from each other. The newer methods should be welcomed as an addition to the older, not regarded as their substitutes. Radiation, he said, did not destroy or remove unwanted cells, but the malignant cells were so changed that they were replaced by others, without necrosis taking place, a metamorphosis without cellular death. If such tissue reaction could not be brought about in a particular case, no amount of radiation would destroy the pathological cell. In most cases the pathological cells were replaced by fibrous tissue, not destroyed as when the cautery was used. This meant that radiation produced an indirect effect, and the question arose whether this indirect effect could be utilised on a larger scale The work of many physicists supported the possibility of liberating for action, by irradiating a large area of the body, some anti-body which was antagonistic to the disease-producing cells.

With regard to the patient, every subject of cancer or other disease must be carefully studied before deciding on irradiation, and an idea formed as to whether curative results were likely to be achieved or only palliative ones.

Dr. Scott said that radiation sickness or malaise was a bugbear to the radiologist. Sometimes this sickness might be sufficient to turn the scale against the patient. It might take the form of vomiting during or shortly after the séance, or the patient might leave feeling well, but in a few hours would feel strange, the stomach feeling upset, or he might have intense headache. In the case of the high-voltage technique the vomiting might become uncontrollable. With low voltage only treatment over a considerable area seemed to cause the sickness, but with the high voltage the sequel followed the treatment of only a small area. He said that during the last 14 years he had used X rays on over 2000 cases of carcinoma of the breast. If the best method of attack in these cases could be decided upon, it would lead well on the road to the successful dealing with cancer as a whole. The primary growth having been removed by the surgeon, the radiologist had not now a tumour to direct his attention to; therefore he had to devise a technique which gave a reasonable chance of destroying cells at various depths and in unknown positions. To prevent recurrences in these cases he considered that heterogeneous irradiation was more valuable than homogeneous. The rays were absorbed at various depths, and large fields could be covered.

He held that there were objections to the high-voltage technique. The field of radiation was too limited, there was no indication of the depth at which the dose should be delivered; damage to lung tissue in breast cases was comparatively frequent; somewhat serious blood changes were set up. A low-voltage treatment embracing practically the whole trunk seemed to extend the range of control of the disease in a gratifying way. He said he would be glad if speakers would state their experiences on the following points: (1) Reduction of secondary nodules or glands after application of the rays to the primary growth. (2) Cases of skin reaction developing on the side of the body opposite to that irradiated. He had not himself encountered such. (3) Deep or late reactions six months or longer after the last irradiation. He had seen it five years after the last séance. (4) The occurrence of radiation sickness and results of its treatment.

Dr. Scott concluded by showing a number of illustrations on the epidiascope.

Problems in Deep Therapy.

Dr. J. H. DOUGLAS WEBSTER thought three kinds of radiation therapy should be recognised: superficial, medium (to 100,000 volts) and really deep therapy (100,000 to 140,000 volts). Cases of breast carcinoma were best treated prophylactically by medium-deep therapy, with 3 mm. of aluminium and 0·2 zinc. In one series published, 140 cases not too far advanced, 60 per cent. remained free of recurrence after three years. The prophylactic post-operative treatment of breast cancer differed, he said, from that of cancer in most other sites, because of the danger of diminishing the effective lung area and inhibiting the vitality of the pleura by the scattered rays. In breast cases the prophylactic treatment should extend over months. When, during the low-voltage treatment, a small recurrence was detected, the high-voltage technique was substituted, and in a large proportion there had been a successful result, the parts involved becoming normal to palpation. Sometimes the great fatality of breast cancer was forgotten. It had been computed, on the basis of statistics, that a patient with breast cancer and involvement of axillary glands had only a 1 in 25 chance. Lee, of New York, said that only 15 per cent. of patients with breast cancer remained alive at the end of five years. Owing to the large surface involved in these breast cases, and the configuration of the region, combined with the question of the degree of mobility of the arm, the problem of an even irradiation was a very difficult one. It was wrong to divide the area into squares and to irradiate each square, as there was a danger of treating twice the edges of the squares, and missing some parts altogether. The irradiation should be done, preferably, by a near technique over a large surface; his practice was to apply the rays from the top of the neck down to the level of the umbilicus at an angle of 30 degrees, from above, from below, from both sides, and from the back, giving, in some cases, an additional dose to the axillary apex and to the clavicular triangle.

Dr. Webster said he had analysed 335 cases of cancer of the breast treated in the last three years; 148 of these were treated with the medium therapy, but 30 of these could be excluded, as they had only one or two treatments and then left. Of the 118, 34 (29 per cent.) died, 36 were still continuing treatment, and 9 of the 36 were well a year after the operation; 38 were well at the end of two years, and were not now having treatment. This meant that 40 per cent. of the cases showed a good result. Many patients had been treated with high voltage in one part, and in another site with a medium voltage. Of 188 breast cases treated with high voltage, 84 had died, and 45 showed a good result and treatment had been discontinued. In some of the cases in which the surgery was incomplete irradiation produced good results. He contended that each bad result should be carefully investigated, owing to the valuable

knowledge it would probably afford. He described the method of "in advance" prophylactic treatment he had carried out for two years, on the basis of Mr. Sampson Handley's idea of centrifugal spread. It was not of a routine nature; what was done was special to each case. He asked whether there was such a dose of rays as could be called stimulant. Growing seeds could be stimulated by a small dose of the rays. Rays directed to a small tumour on the forehead at once increased the activity and growth of a tumour behind the ear.

The debate was adjourned to a date to be determined.

BRISTOL MEDICO-CHIRURGICAL SOCIETY.

A MEETING of this Society was held at the University, Bristol, on March 11th, Dr. J. O. SYMES, the President, being in the chair.

Dr. R. C. CLARKE opened a discussion on the

Catarrhal Child.

He said that his views were based on extensive observations in children's clinics of several thousand children, and represented ideas that had forced themselves upon him. The subject was one that had not received the attention that it deserved. Only of late years had the routine examination of children supposed healthy been systematically undertaken. When advice was sought only for acute bronchitis or broncho-pneumonia, the significance of preceding bronchial infections might escape notice. Among children between 3 and 6 weeks old, not less than half were already subjects of respiratory catarrh—in the last 1000 cases the exact figures were, 499 with catarrh, 501 without. "Catarrh" was diagnosed on the simultaneous presence of three signs: (*a*) snuffles, (*b*) Harrison's sulcus, and (*c*) definite bronchial catarrh, determined by auscultation. In this connexion, he wished to warn about "snuffles." A nasal catarrh, a napkin rash, and the marasmus which followed inability to suck, from nasal obstruction, must not lead to the (false) diagnosis of congenital syphilis.

When a young infant "caught cold," the first thing that occurred was nasal obstruction. The whole respiratory mechanism was thrown out of gear, for infants refused to breathe except through the nose. Only when half stifled would they open the mouth and breathe through that, so that sleep was disturbed. The drawing in of the lower ribs produced Harrison's sulcus; the latter was a sign solely of nasal obstruction. Rickets might emphasise it, but did not cause it. Since sucking was deficient, feeding became very difficult; if the child did not suck properly, the natural stimulus of the breast was lost, and the breast-milk might go—a disaster of the first magnitude, especially among the poor. The earlier the catarrh affected the child the longer it took to clear up and the greater the certainty that the chest would be affected. If the first "cold" could be postponed till after the sixth month it was practically certain that the chest would escape. But every baby that had nasal catarrh under 4 weeks old (in a series of 400 sufferers) had bronchitis. Further, he believed that once a child became bronchitic it remained bronchitic; every cold "flew to the chest," and it was proper to describe some children of only 6 months old as "chronic bronchitics." As the children grew up the attacks continued; but between the acute attacks there could always be found signs in the chest. The bronchitic baby produced the bronchitic child, and later the bronchitic man—witness the almost invariable presence of Harrison's sulcus in pensioners with bronchitis. Further, he believed that chronic nasal catarrh was the one and only cause of "tonsils and adenoids"; the latter phenomenon was merely a part of the picture of chronic respiratory catarrh. A badly developed nasal organ, leading to deflection of the septum, and a permanently damaged mucosa leading to chronic sinus disease, were other sequelæ of the same condition. The otitis media which was so very common among school-children was probably only a recurrence of an unnoticed otitis of infancy.

The development of this catarrhal condition depended on two factors: (1) the number and virulence of the organisms reaching the mucosa and (2) the local and general resistance. (1) The amount of infection depended on the presence of persons carrying these organisms, and the lack of ventilation. (2) As to resistance, he did not think the mucosa of the young infant had any power of resistance; and the membrane which had been subjected to repeated infection never gained this power, which was otherwise definite. The very young baby invariably got the whole respiratory tract infected if any part was involved.

Prophylaxis of this condition was not difficult. During the first six months of life every effort must be made to avoid infection. The baby should live in the open air, even in a draught; this rule should not be broken even during the bath. The mother should be examined to exclude chronic *suppurative* rhinitis; if this was found, the use of a mask during the whole time that she was doing anything for the infant was important. The same rule applied to the nurse, though no nurse with a definite nasal infection should be engaged. All visitors should be subjected to the same rule, and never allowed to kiss the child. The parent, nurse, or other children who were carriers presented a difficulty—that is, those who nourished the organisms of disease without manifesting symptoms. As for treatment of older children, this was important because the mucous membrane, if preserved from repeated infection, did recover some power of resistance. Hopelessly infected tonsils and adenoids should be removed. The same general hygienic rules as for infants should be observed; the child should live in the open air; and visits to the kinema and parties should be reduced to a minimum. Cod-liver oil was the only medicine of any value.

The PRESIDENT thought that Dr. Clarke had described an entirely new disease. He had not himself met with this disease. He thought that up to 6 months of age children were extraordinarily immune to infection. The picture they had had presented might be produced by underfeeding, rickets, or teething—all might manifest "catarrh," without there being any infection. He suggested that small children did not readily clear the trachea of secretion, which might lead to râles.

Dr. C. E. K. HERAPATH agreed with Dr. Clarke, but he thought it a disease of the hospital class. As for clearing the air-passages, very young babies sneezed more than adults.

Mr. J. P. I. HARTY believed that infection of the air-passages could take place at a later age than that discussed by Dr. Clarke, especially from parent or nurse. Otitis media was quite common at the very earliest ages. He thought adenoids should be removed at any age, without waiting.

Dr. P. WATSON-WILLIAMS said that the tonsils should not be removed in very young children; these glands had often great value in the fight with infection, and should be preserved as long as possible. Having had many years' experience as a physician, and given especial attention to the chest, he could not agree with the large incidence of bronchitis described. He was interested to hear Dr. Clarke's observations relating to the occurrence of sinus disease in families; he (Dr. Watson-Williams) had had many cases where sinus disease occurring in all the children of a family co-existed with a latent sinus infection—perhaps producing no symptoms—in one or other parent.

Dr. R. A. ASKINS (school medical officer) thought 20 per cent. of all children of school age suffered from adenoids. The prevention of so much sickness was of first importance. Further, bronchitis was very common among the children at primary schools. He had observed the frequency with which the operative treatment of tonsils and adenoids was needed in

all members of a family. He considered that children had some inherited immunity, as regards ordinary infections, which lasted for some months after birth; but this did not apply to catarrhal infections.

Dr. J. A. NIXON thought that though Dr. Clarke's views were extremely heterodox, they drew attention to an important aspect of catarrh. Why should the chronic sequelæ of catarrh occur only in the poorer classes? What factor was concerned other than perhaps feeding? He thought it was very necessary to guard the new-born from loss of heat—was this properly done among the poor? One need never mistake catarrh for congenital syphilis; in the latter the discharge was *purulent*. He agreed that Harrison's sulcus was a sign of nasal obstruction only. Dr. Clarke had omitted the question of asthmatic children, those sensitive to certain proteins; such a condition might lead to bronchitis.

Dr. J. R. R. TRIST called attention to the extreme sensitivity of other mucous membranes in the young child, such as the vaginal. He agreed with the view that young children should be properly protected from loss of heat.

Dr. C. J. C. FAILL pointed out that the tuberculous child was not "catarrhal." If children were to be exposed in all weathers to the open air—i.e., naked—they must have bronzed skin and be well fed—then they did not require clothing.

Mr. A. W. ADAMS pointed out that new-born babies seemed immune from empyema; he thought this could hardly be consistent with such a very high incidence of bronchial infection.

Dr. J. A. BIRRELL asked what was the death-rate among these children. He felt that perhaps Dr. Clarke had mistaken the sounds produced by a flapping soft palate for bronchial râles. Did asthma occur at the age of a few weeks, and was "croup" a condition analogous to asthma? He could not agree that new-born children might safely be exposed to cold.

Dr. CLARKE, in reply, said that he thought the new-born child was infected very readily. Pneumonia did occur in children of this age, and explained some of the cases of "sudden death" in infants. His figures were from four clinics, but all from the lower strata of the population. Catarrh did not confer any immunity, but rather predisposed to a further infection. He had formerly thought that repeated infection was the principal factor in producing the chronic catarrhal child, but now he thought that the *earliness* of the infection was the real deciding factor. Children did not seem to mind the cold, but the poor used much more clothing for their children than the well-to-do. He thought that most cases of asthma in young children were really bronchitic.

Exhibition of Cases.

Mr. H. CHITTY showed three cases: (1) Osteomalacia in a girl of 18. Union of ununited fractures of the tibiæ followed local injections of colloidal magnesium. (2) Ununited fracture of the tibia, in a child of 5. Local injections of magnesium, and a rib graft, had alike proved ineffectual. (3) Double pleural empyema in a child. Both sides of the chest were opened at the same operation, with perfect result.

Mr. ADAMS showed a case of malignant disease of the thyroid, with secondary glands, relieved by operation; specimens and sections were shown with the case.

Election of Honorary Member.

On the motion of Dr. NIXON, Dr. James Swain was elected an honorary member of the Society. Dr. Swain had been for 25 years a member of the Editorial Committee of the Society's Journal, and for longer a very active member of the Society. The PRESIDENT, in announcing the result of the vote, pointed out that honorary membership was very rarely conferred, there being only two other living honorary members.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF STATE MEDICINE.

A MEETING of this Section was held in the Royal College of Physicians of Ireland on March 13th, Dr. N. M. FALKINER, the President, in the chair.

Dr. BRIAN CRICHTON read a paper on

Infant Mortality.

He compared the infant mortality rates of various English towns with that of Dublin (125). To produce a healthy child, healthy parents, healthy surroundings, and good food were necessary. The greater portion of the centre of Dublin was hygienically bad and to be condemned. Not more than 50 persons should be allowed to live on each acre, but in some wards in Dublin the number per acre was as high as 117 or even 138. Dr. Crichton then outlined a scheme for the improvement of child life in Dublin. Use should be made of the existing maternity hospitals in Dublin, the Rotunda, the Coombe and the National Maternity, to which mothers have been accustomed to go for advice. Attached to these there should be welfare centres, both antenatal and postnatal. At these the mothers could be advised as to the health and feeding of their children and food could be supplied at as near cost price as possible. Almoners and specially trained district visitors could go from these to visit the infants in their homes. These centres would also be very useful for the training of students and nurses. As regards older children, he pointed out the need for special schools for mentally deficient children and also for open-air schools for delicate children. In concluding, Dr. Crichton referred to the death-rate among illegitimate children, which was six times that of legitimate children.

Sir JOHN MOORE emphasised his belief that it was the bounden duty of every mother to feed her child during the first nine months of the child's life, and he thought this was a duty which was very often disregarded. Sometimes, of course, it was impossible for the mother to feed her child, but the natural food for an infant was the mother's milk. Recently there had been a great practice of feeding children with milk which was contaminated, or with preparations of milk which were very often probably poisoned.

Prof. J. W. BIGGER drew attention to the position regarding infantile mortality in Ireland compared with that in England. The mortality in Ireland in 1923 in the Free State was 66 per 1000, while in England and Wales it was 69 per 1000. Therefore Ireland was in a rather better position than England and Wales. He felt that Ireland at present was contented with her position, because it was said that the Irish infantile mortality rate was much less than anywhere else, and so nothing was done to get it still lower. It had been recognised in England and Wales since 1904 that the rate there was too high, and steps had been taken to bring it down, and had been successful. If this had been done in Ireland, the rate in 1923 should have been only 47 per 1000, instead of 66 per 1000. Premature births, he said, were accountable for about 6 deaths out of every 1000 births, and if the scheme which Dr. Crichton had outlined, of setting up pre-natal schools in connexion with the maternity institutions in Dublin could be brought about, he thought that a great many of these deaths could be avoided.

Dr. R. H. MICKS referred to the number of sickly wasting children who had come to general hospitals and whose parents thought they could be cured in a week, whereas they could not even be cured in a month, for it sometimes took several months to effect any improvement in their condition. Really bad cases of marasmus took a year to cure. He referred to the danger of the "tuberculosis houses" of which there were so many in Dublin, and the number of children suffering from tuberculosis, which was probably due to the unhealthy state of their

surroundings. This was not the fault of the parents, for no better houses were obtainable.

Prof. J. T. WIGHAM said that it had been asked why infant mortality should be avoided, since an easy way of limiting the population was for children to die soon after birth. It had been pointed out that at present there was a great excess of unskilled labour, and a great many of the town-born children grew up as unskilled labourers. He thought that the answer to such a question was that infantile mortality was an index of children's disease, and that a great many children who did survive from disease in childhood were unfitted to be proper citizens.

Dr. W. D. O'KELLY, Dr. N. M. FALKINER, jun., Dr. P. DE BURCA, and Dr. KENNEDY CAHILL further contributed to the discussion, to which Dr. CRICHTON replied.

PLYMOUTH MEDICAL SOCIETY.

AT a clinical meeting of this Society, held at Beaumont House on March 17th, Mr. C. L. LANDER, the President, showed a case of splenomegalic polycythæmia of many years' duration.—Mr. H. F. VELLACOTT showed a tumour of the lower part of the thigh in a man aged 27, who gave a history of six years' duration. A cystic tumour had been removed elsewhere two years before. It was generally held that the present condition was sarcomatous, and such it appeared to be to the naked eye on examination of a fragment removed next day for microscopic report.—Mr. C. M. KENNEDY showed two cases: (1) A young man with an ulcer of the tongue suffering, in addition, from tuberculous epididymitis and chronic phthisis. It was an example of the solitary tuberculous ulcer of the tongue. (2) An old man with a mass in the back of the tongue, not ulcerated. The glands beneath the jaws were extensively involved. The history extended over a month; Wassermann negative. This was probably an epithelioma, and not inflammatory.—Mr. J. R. ROLSTON showed the eyes of a child, aged 10 months, removed on account of gliomata growing from both retinæ.—Mr. EDRIC WILSON showed a man suffering from hypertrophic biliary cirrhosis, bronzed, with large liver and spleen. He showed also the plates of a case of Perthe's disease and outlined the treatment of this condition of the hip-joint, which formerly was taken to be tuberculous. It was probably of the nature of a mild staphylococcal infection, and had to be differentiated from slipped epiphysis and osteo-arthritis of a juvenile type.

The PRESIDENT read a note on the relation of herpes to chicken-pox.—Dr. J. RIDDEL read the notes of a case of puerperal septicæmia which recovered after many rigors with temperature 107° F. The uterine condition quickly settled down after a large-sized tube had been placed in the uterus to allow of frequent ensol irrigations, but septic thrombosed piles seemed to provide the source of infection which led to the rigors with hyperpyrexia. Blood cultures were negative.—Mr. HAMILTON WHITEFORD read notes of 11 cases collected from the literature to illustrate the results of the operation of lymphaticostomy as practised by Costain. It was possible to trace four recoveries and three deaths, and the operation appeared to be worthy of further attention, though it seemed, at first sight, strange to operate in the neck to cure a pathological condition of the abdomen.

TWO YORKSHIRE HOSPITALS.—Princess Mary has opened the King Edward VII. Memorial Wing of Pontefract General Infirmary free of debt, the whole of the £12,000 which it has cost having been subscribed. The wing contains two wards, each of which will accommodate 12 patients; there is, in addition, a small private ward of three beds. During 1924 the out-patients at Batley and District Hospital increased by nearly 1000, and £24,000 is about to be spent upon extensions and improved equipment.

Reviews and Notices of Books.

A SYNOPSIS OF SPECIAL SUBJECTS.

Diseases of the Skin. By H. C. SEMON, M.A., M.D. *Obstetrics and Diseases of Women.* By MALCOLM DONALDSON, M.B., B.Ch., F.R.C.S. *Diseases of the Ear, Nose, and Throat.* By ARCHER RYLAND, F.R.C.S. Edin. *Diseases of the Eye.* By J. F. CUNNINGHAM, O.B.E., F.R.C.S. London: H. K. Lewis and Co. 1924. Pp. 376. 18*s*.

THIS handy volume will undoubtedly receive a warm welcome from the busy practitioner, and will take its place on his shelf beside the well-known companion volumes of Tidy, Hey Groves, and Wheeler and Jack.

The authors state in their preface that their work "cannot be commended from the literary or educational point of view. Its aim is practical." The practical aim is not one to be deprecated, and the need of the average medical man in special subjects such as these is primarily for some reliable condensation of modern knowledge that will help him to accurate diagnosis and immediate treatment. The conduct of a long or serious disease or major operation in special regions is not usually carried through without consultant advice, and too much detail in a text-book is both superfluous and irritating to the busy man. The error here lies, perhaps, in over great condensation; the sections headed "treatment" are in some cases disappointingly brief. The practitioner who relies wholly on this book for information as to the management of such common complaints as acne and pruritus, for instance, will find himself at the end of his resources sooner than he need be. The subject of dermatology is, in the present state of our knowledge, so difficult that the practitioner would be grateful for ample variety in the possible treatments to be applied, and for rather more definite guidance as to the length of time that must be allowed to elapse before a change may be anticipated.

The section on obstetrics is particularly up-to-date and adequate, considering its condensation, and to those who desire a synopsis of this subject can be cordially recommended. It seems open to question, however, whether it is wise to include this difficult subject in such a book. It is a part of medical practice in which the average doctor is rightly expected to be more competent than in the other "special subjects." He should not be encouraged to acquire a smattering, and he is not in the habit of calling in specialist advice for any case which deviates from the normal. His acquaintance with the varieties, dangers, and treatment of normal and abnormal childbirth, therefore, ought to be extensive, and a synopsis, however excellent, may not help him much. The gynæcological part of the book is less satisfactory than the obstetric; it gives the impression of having been written from the point of view of a gynæcological surgeon rather than that of the practitioner. The word "leucorrhœa," for instance, does not occur in the index, yet its colloquial equivalent is ever on the lips of the patient. The great need of the practitioner is for some advice on the management of such symptomatic disorders. Again, there are many psychological and domestic factors in sterility which should be investigated before the patient is "examined thoroughly from head to foot" or oxygen is passed through the cervical canal, but these preliminary considerations are not mentioned. In the treatment of dysmenorrhœa there is no reference to the use of antipyrine and caffeine or the endocrine preparations, while the frequent psychological factor is completely ignored. The only treatment suggested for senile endometritis is the application of radium. These are the considerations which present themselves in the consultant's house after the ground has been cleared for him by the less elaborate or "common-sense" procedure of the local doctor, but for a practitioner who is not sufficiently experienced to do these things without the

aid of a "synopsis" there should be some reference, at least, to the part he has to play.

Such criticisms cannot be directed against the two other sections—viz., those on diseases of the ear, nose, and throat, and the eye. Here particular attention has been paid to the points which are of importance in the earlier stages and simple everyday management of the conditions dealt with. The treatments are given with full practical detail and, in the former section, with plenty of actual prescriptions, which are always a welcome sight to the young practitioner. The ground covered is extensive, but the condensation is adequately carried out, room being found for such matters as geographical distribution, ætiological theories, comparative tables of diagnostic symptoms, and valuable cautions as to the use of certain forms of treatment. These two sections alone would make the book a sound investment, and there is a great deal in the section on obstetrics which is of value. A minor fault of production which is somewhat irritating to the reader is the use of too thick capitals for the headings of "Diagnosis," "Treatment," &c., which causes these to stand out more clearly than the varieties of disease which are being considered. This makes it difficult for a searcher to find quickly the point desired.

The compilation will assuredly be welcomed.

THE LIFE-STORY OF THE ADDER.

By NORMAN MORRISON, F.Z.S. Scot. Paisley: Alex. Gardner, Ltd. 6s.

FROM Bible story down through mythological legend, mediæval therapeutics, and folk-lore to Freudian interpretations there are many evidences how deeply the snake family has interested mankind. No doubt the danger of snake-bite has much to do with this, and, even in our island, there are plenty of instances (one is recorded, for example, in THE LANCET of March 14th) that such an accident may be no trivial matter. In themselves, however, these creatures are well worth careful study, and Mr. Morrison, in this unpretentious but most interesting little book, has rendered a real service to natural history. We can never have too many students of his kind, who devote themselves to the observation of the living animal.

Those of our readers who practise in the country will add one interest more to their walks if they submit themselves to the spell of this book.

LOUIS PASTEUR.

By S. J. HOLMES, Ph.D., Professor of Zoology in the University of California. London: Chapman and Hall. Pp. 246. 7s. 6d.

Prof. Holmes, in his preface, says that he makes no apology for adding to the number of books upon Pasteur. We fancy that some is needed. Apart from the Life, by Vallery-Radot, we do not know exactly how many shorter accounts have been published, but the field in English seems adequately filled by the admirable American version of Duclaux and by Descour, which has been translated by the Wedds. If the present account had any new facts to bring out, or if it looked at the subject from any new point of view, there might be something to be said for it, but it is, as the author says, just a brief and simple account of Pasteur's methods and his chief discoveries such as has been given again and again. It fails, too, as others have failed, to bring out Pasteur's real importance which is, not that he made human life more convenient by teaching Frenchmen to make as good beer as Germans or by discovering a cure for hydrophobia, but that he persuaded the world to believe that bacteria were of importance and not merely the objects of curious interest they had been since Leeuwenhock first clearly described their appearances. Let it be added, too, that Prof. Holmes follows his predecessors in easily falling into a vein of hyperbolic exaggeration; talking of the relations of Pasteur to the Academy of Medicine, he says (p. 156): "Little did his medical colleagues then realise that they were dealing with a man whose discoveries with regard to disease were to be of greater value than those of all the academies of medicine in the history of the world," which is a nonsensical comment on the natural and desirable scepticism with which Pasteur's views were at first received. A cult pursued in this vein finds its suitable goal in canonisation; it is out of place in scientific biography.

THE WEBER COLLECTION.

Vol. II. Macedon, Thrace, Thessaly, North-Western, Central, and Southern Greece. By L. FORRER. London: Spink and Son. 1924. Pp. 579. With portfolio of 102 plates. £3 3s.

THE first volume of Mr. Forrer's catalogue describing the Greek coins collected by the late Sir Hermann Weber, M.D., was reviewed in THE LANCET in 1923 (i., 199). The splendid second volumes of text and plates which Mr. Forrer has now produced deal with that part of the collection comprising the cities of European Greece from Thrace and the Euxine to Peloponnesus, together with Crete and the islands of the Ægean Sea. Nearly 3000 coins are here described, including many individual specimens of outstanding merit and interest, and a number of unusually full and important series of the coins of a particular mint. There are, for example, 150 coins of Athens (including three specimens of the later gold coinage), 175 coins of Corinth (with important specimens of the earliest coinage), 82 coins of Elis, of which no less than 47 are staters, the highest denomination of the silver coinage of this mint and among the most treasured of ancient coins for their supreme artistic merit. Of less importance are the 39 coins of the Thracian Chersonese, but it may be noted that no less than 14 varieties were not to be found in the British Museum collection to which they have now passed. The coinage of the kings of Macedonia, the interesting early coins of the wild Macedonian tribes, the coins of the kings of Pæonia, and those of Thrace in general are all well represented. There are many beautiful specimens of the coinage of the Thessalian towns where, except in a few cases, the output was never large.

Among the more important individual coins may be noticed three staters of Amphipolis with the famous type of the full-face head of Apollo, a unique stater of the Acarnanians struck at Œniadæ and showing figures of Apollo and Herakles, an example of the famous staters of the Amphictyonic Council, probably struck for the Pythian festival in 346 B.C., after the Phocian War, the stater of Arcadia with Pan seated on a rock, and the beautiful stater of Pheneus showing Hermes running with the child Arkas. There is also a drachm of Pheneus with Hermes seated on a rock. The more important gold coins include a stater of Panticapæum and the half-stater of Pyrrhus, King of Epirus. Among rare Thessalian coins may be noticed the didrachm of the Œtæi with the lion's head and Herakles for types as on the commoner smaller denominations. There are fine specimens of the rare but better known silver coins of Abdera, Ænus, the Chalcidic League, Larissa, the Opontian Locrians, and Messenia. Two large coins of Dicæa, weighing 283 and 150 gr. respectively, with the usual type of a head of Herakles as found on the smaller coins, call for special mention, as does the tetradrachm of the Thracian Chersonese with a lion and an archaic head of Athene for types. With this coin may be classed two very rare coins assigned by Mr. Forrer, with a query, to Olynthus. Both show on one side a quadriga viewed from the front; for the other type one has an irregular pattern, and the other, the only specimen known, a male head. Mr. C. T. Seltman, in his recent work "Athens: Its History and Coinage," assigns all these coins to the Athenian tyrants—Miltiades I. and his nephews Stesagoras and

Miltiades II., who made themselves lords of the Thracian Chersonese during the period 559–493 B.C.

It has been stated that Sir Hermann Weber's interest in ancient coins was "first roused by types referring to the healing art." In this connexion one naturally turns to the coins of Epidaurus, where the types refer to the worship of Asklepios. No. 4223 is an example of the very rare drachms of Epidaurus, which have for types on one side a head of Apollo, the father of Asklepios, and on the other, Asklepios seated on his throne with his right hand extended over the head of a serpent. Beneath the throne is a dog. As is well known, a kind of faith-healing was practised at this place. The sufferers slept in the sacred shrine and the god manifested himself to them in their dreams. It would appear from the record of the "cures" which have been left on inscriptions that sacred serpents and dogs were kept in the shrine and were supposed to heal the sick by licking them. Examples of the "cures" are given by Dr. Singer in his interesting chapter on Greek medicine in the volume of essays, "The Legacy of Greece," published in 1922 by the Oxford Press. Other coins show Epione, the wife of Asklepios, and the instrument known as the cupping vessel occurs as a symbol beside the main type. The cupping vessel is a type found elsewhere, at Astacus in Acarnania and, with forceps, on coins of the Thessalian town Atrax. Thessaly was another centre of the worship of Asklepios and was the home of Cheiron, the wisest of the Centaurs and renowned for his skill in medicine. At Tricca, the legendary birthplace of Asklepios and mentioned by Homer as subject to his sons Podaleirios and Machaon, the doctors of the Greek army at Troy, was the oldest of all the temples of Asklepios in Greece. On the coins of Tricca appear an interesting type of Asklepios feeding his sacred serpent with a bird. A similar type appears on coins of Larissa and Magnetes. It is perhaps appropriate that the most famous of ancient sufferers, the hero Philoctetes, had his home in Thessaly, though it will be remembered that his pains could not be alleviated by the medical skill of the time, and his cries so distressed the Trojan host that he had to be marooned. Philoctetes is shown on the coins of his native town Lamia. Specimens of all these coins are to be found in the Weber collection.

It only remains to add that the publication has been carried through by Messrs. Spink and Son in the same lavish way as was the case with Vol. I., and that Mr. Forrer is to be congratulated once again for the care with which he has described the coins. There is only one place where what seems to be an error can be noticed. No. 3140, a coin of the Opuntian Locrians of the period before 338 B.C., has been re-struck; according to Mr. Forrer the original coin was "apparently a Syracusan tetradrachm." But the piece weighs 184 gr.—i.e., it is of Æginetan weight, as would be expected for Locris, while if it had originally been a Syracusan tetradrachm the weight would be *c.* 260 gr.

Christ's College, Cambridge. S. W. GROSE.

JOURNALS.

SURGERY, GYNÆCOLOGY, AND OBSTETRICS. Vol. IX., No. 1.—Basic Principles and Supreme Difficulties in Gastric Surgery. A survey of the end-results of the various operations of gastric surgery is given by H. B. Devine in a series of 1000 cases. Evidence is produced to show that a good result is only achieved if regurgitation is established, no matter whether the operation used be a simple gastro-enterostomy or a partial gastrectomy, and it is suggested that as the former procedure does not always succeed in accomplishing this object, partial gastric exclusion may be used with less risk to the patient than partial gastrectomy, with equally good results. It is thought that this procedure by partly cutting off the sympathetic supply to the stomach alters its tone and so allows of better regurgitation.—L. R. Whitaker and G. Milliken: A Comparison of Sodium Tetra-Bromphenol-phthalein with Sodium Tetrarodo-Bromphenol-phthalein in Gall-bladder Radiography. As the iodine salt is nearly twice as opaque as the bromine to X rays and the toxicity is shown to be about equal, it appears that the iodine salt is the better. The author's experiments confirm their suggestion that this is so.—Margaret S. Witter: Post-operative Leucocytosis. The author gives the result of careful post-operative leucocyte counts and shows that there is a leucocytosis which reaches an average maximum of 18,000 four hours after operation and returns to normal by the fifth day.—R. W. McNealy: The Place of Electiol Vein Ligation in Blood-vessel Surgery. Simultaneous ligation of both artery and vein of a limb is less likely to be followed by gangrene than ligation of the artery alone. Cases are quoted showing that in threatened gangrene the vein may be ligatured as a therapeutic measure in selected cases.—C. W. Rand: Tumour of the Left Gasserian Ganglion. A report of a case of endothelioma successfully removed at operation.—R. H. Jackson: Extensive Resection of the Small Intestine in an Infant. There is some doubt as to how much of the small intestine may be removed without seriously affecting the nutrition of a child. A case is reported in which 4 ft. 8 in. of the lower part of the small intestine was resected in a child of 2 years. This is thought to be about 2/5ths of the total in a child of this age. This child is now 9 years old and is of normal weight and development.—F. M. Pottenger: Pain from Pleura Simulating that from Abdomen. It is shown by a consideration of segmental nerve distribution that pleural injury may give rise to pain simulating that of an abdominal lesion.—Richard Lewisohn: The Frequency of Gastro-jejunal Ulcers In the writer's series gastro-jejunal ulcers developed in 34 per cent. of gastro-enterostomies. Partial gastrectomy is advised to cure these cases, and it is suggested that if performed in the first instance it would prevent them.—W. H. Goeckerman: The Effect of Surgical Trauma in Patients with Syphilis, with Special Reference to Healing of the Post-operative Wound. Although it is advisable that syphilis should be treated before operation, evidence suggests that the tissues of the syphilitic heal as well as those of the non-syphilitic patient.—Howard K. Tuttle: The Treatment of Abortion. The question whether early operation or expectant treatment in abortion gives the better result remains doubtful. In this article the results of early operation in all cases (1164) are given, and show that under hospital conditions the results of this treatment are similar to those given in recent papers advocating the expectant measures. In selected cases expectant treatment is advised.—Hugh H. Young: The Treatment of Infections, General, Local, and Urinary with Intravenous Injections of Mercurochrome. A review of 255 cases in which mercurochrome injections were used convince the author of its value. Various cases of septicæmia, pneumonia, and encephalitis are quoted, many of them severe, in which rapid recovery followed. The dose used varied up to a maximum of 7 milligrammes per kilo. 75 per cent. of the patients recovered and of these results 42 per cent. were thought to be due to this drug. Severe reaction occurred in 28 cases and two patients died soon after an injection.—The department of technique is largely occupied by two articles on the Treatment of Fractures of the Femur by H. E. Conwell and Mrs. Langworthy.

ERRATUM.—A commendation to our readers in THE LANCET of March 14th of a small book on "Pernicious Anæmia and Aplastic Anæmia," written by Dr. Arthur Sheard, unfortunately stated the name of the author wrongly. We are sorry that Dr. Sheard's useful contribution to a difficult subject should have been credited in the wrong place. The book is published by John Wright and Sons, Ltd., Bristol.

THE LANCET.

LONDON: SATURDAY, MARCH 28, 1925.

THE MEDICAL CURRICULUM: AN INTERNATIONAL SURVEY.

EVERYONE who read with interest Mr. ABRAHAM FLEXNER'S first critical account of medical education in Western Europe and America 12 years ago will welcome his new volume,[1] in which he re-surveys the field. Apart from the writings of Sir GEORGE NEWMAN, the debates at the General Medical Council, and the consequent articles and reports in our own columns, there has been little said on the general bearings of the medical curriculum, either in this country or elsewhere, before his first report. It was consequently something of a revelation to many people that there was so much that wanted saying on the subject and so many problems to be discussed and, if possible, solved. There has indeed been a troubling of the waters since, and the widespread reforms achieved in America have brought home to us on this side healthy doubt as to the perfection of our own methods and results. Twenty years ago there were in the United States about 400 schools producing qualified medical men; four or five were good, a few mediocre, the rest ranged from pretty bad to scandalous frauds. There are now about 90; almost all might fairly be called good, while ten or a dozen reach a level which in most respects is not bettered elsewhere. In our country the situation was, of course, different; there was nothing scandalous enough to attract attention, but Mr. FLEXNER draws attention to a good deal which in the natural course of development has come to be inadequate and out of date. We are not prepared to agree with Mr. FLEXNER always, but every thinking medical man must be grateful to him for the stimulus of his visits and the help which his critical discussions have given to those who believe that the excursions and alarms in our own medical schools in recent years have been properly directed to the ventilation of questions which needed consideration. Grateful, too, should we be for the restraint which has reduced to a moderate and most readable compass the results of repeated visits to many of the chief medical schools of Western Europe and America; we doubt whether there is a word for each mile that must have been travelled. To those for whom science consists in reducing facts to numbers, considering the possibilities of the subject, the volume will seem about as unscientific a product of such an inquiry as one could imagine; for Mr. FLEXNER gives hardly any statistics. But all engaged in medical education will be grateful for the work, and many will be grateful for the lack of percentages.

Mr. FLEXNER'S book covers broadly two topics. It describes the facts as they are now in relation to what they were 15 years ago, and it discusses the theory of medical education with the object of discovering the best possible method of achieving it. Easy reading as it makes, it is closely written and no summary of the facts is possible; those who are not familiar with them will find much food for thought in the fundamental differences of ideals and methods which characterise French, German, and British practice. And on the theoretical side we must equally urge our readers to resort to the original for an adequate appreciation of Mr. FLEXNER'S conclusions. In taking up certain of his points which are of particular interest to ourselves, let it be pointed out that no attempt is made by the author to value the relative virtues of the different methods of education, which he exposes, by measuring the efficiency of their products in terms of the work-a-day medical man. Whether the practitioners trained in didactic clinical French schools are any more or less fit to take care of their patients than those brought up in the German university clinics, or in the practical British schools, is apparently regarded as being either beside the point or an insoluble point. Insoluble it almost certainly is, and if the facts could truly be ascertained we could not fairly attribute any demonstrable contrasts to differences in the medical curriculum without being sure that the curricula were brought to bear on similar material. Which they are not. And Mr. FLEXNER is right in arguing the matter from general principles rather than by embarking on what must necessarily have been an unconvincing direct comparison of results. He has a complete faith in the ideals of university education; better education cannot fail to produce a better product. And what he has to say will appeal with less cogency to those less well equipped in that faith. His main argument is roughly this. Medicine is a science or so near a science as makes no difference. Whether it is called an art, or a science, or an empiric art making its way towards becoming a science, it has accepted the fundamental criteria of a science and has pledged itself to the critical scrutiny of facts, thus adopting the scientific spirit and aim. It is therefore best studied in the way which has proved most successful in other sciences—i.e., for its own sake and by people whose sole concern is with the advancement of knowledge by teaching and original inquiry. As examples of success the German universities in the third and fourth quarters of last century are the most conspicuous; physiology in our own country is also an obvious model. Medicine should, it is argued accordingly, be treated in the university spirit and by the university technique, and the ideals of its teachers should be identical with those which vivify zoology, philology, or mathematics. If these general principles are to have effect in medicine, it is obvious that a good many of the medical schools in America, all of those in this country, and still more markedly the French establishments, require considerable revision. Dealing with our own schools in regard to clinical subjects, we note that Mr. FLEXNER criticises the schools in the following ways. The hospitals, which are the necessary laboratories of the clinical staff, are not under university control; they exist primarily for the treatment of the sick poor and not for teaching and investigation; though good-will and common-sense may effect a fair compromise, the two objects are by no means always compatible; the heterogeneous collection of diseases, for example, which is desirable for under-graduate teaching is most unsuitable for investigation and may make real investigation impossible; the selection of cases on the test of illness and poverty is not what a university school would choose as the best procedure. On the question of staff, he is quite definite that the "whole-time" system can alone achieve the best results, and that the arrangement by which professors of medicine may have their main preoccupation in private practice is incompatible with university ideals. "Whole-time" is perhaps rather an unfortunate

[1] Medical Education: A Comparative Study. By Abraham Flexner. New York: Macmillan Co. Pp. 334. 1925.

expression; it means not that a man should spend his whole working time in the business of his wards and laboratories, but that his real absorbing interest in life is the progress of knowledge, and that he should be relieved of the necessity of earning his living in a competitive professional life in order that he may freely exploit his passion. In other words, the "whole-time" ideal is reached by having the right spirit, not the correct time-table. And in the presence of the right spirit the details may work themselves out in a variety of ways. The professor must indeed be "whole-time" in fact; even that is far less than he needs for his own education. And if he thinks he can profit by seeing private patients, let him do so by all means so long as he has no pecuniary interest in his consultations. Of his assistants some may be whole-time, some may be part-time; the right spirit again will be able to bring into useful coöperation a varied and varying collection of human instruments; enthusiasm is more than organisation. Mr. FLEXNER criticises severely the sad in-breeding habit of our schools—a habit which, it seems, prevails in America as well and is almost unknown in the Germanic countries. Other things being equal, the scale ought to be against the local man rather than in his favour; a wider horizon, a different training, a fresh outlook, are worth more than the clubbable qualities which sometimes determine appointments.

Such are some of the comments which are passed on our own methods of conducting medical studies, which, based on an entirely different ideal, have aimed at producing men ready for practice. This, Mr. FLEXNER urges, is impossible; the medical school cannot expect to produce fully-trained doctors; it can at most hope to equip students with a limited amount of knowledge, to train them in the method and spirit of scientific medicine, and to launch them with a momentum that will make them active learners for years to come. And yet with a curious flair, on which he comments in another passage, Mr. FLEXNER judges that our actual clinical teaching is probably the soundest in the world. Its merits are great and obvious: "they are" (we quote) "fully appreciated by the British themselves and not unappreciated in other countries." But this excellent finish he finds to be applied to ill-prepared and unsuitable material, for the standard of general education necessary for admission as a medical student is lower than anywhere else—lower on paper than in America, and lower in fact than on the Continent. Medical education, we agree, cannot be for everyone: it is too exacting; the ill-taught and badly-trained schoolboy cannot legitimately find a place in it with advantage to himself or the public. When the student passes from school to college to begin his specialised career, he is apt to be met with an *ad hoc* conception of the medical sciences which is wholly mistaken and short-sighted. "Anatomy, physiology, and pathology are sciences as such, just as they would be if it had never occurred to anyone to include them in the medical curriculum," says Mr. FLEXNER, and if they are not cultivated in a broad university spirit as legitimate objects of human curiosity they will be sterile. If, as is often said now-a-days, they must be presented from a medical aspect to arouse the interest of the student, the remedy is to change the student. Mr. FLEXNER, therefore, would have us believe that our ideals and methods need examination and perhaps revision, while his remarks on the curriculisation of American education, the mediæval French procedure, and the didactic clinical teaching in Germany will give warning of many, perhaps unsuspected, fires to those who want to get out of their own frying-pan. And, if we have emphasised his criticisms, let it be realised that he is always constructive both in urging on everyone the ideal which he serves and in indicating the practical details through which it may be served. After all, as the cover of the book reminds us, medical education is not medicine but education—and it is at least possible that this point of view has been rather overlooked. Few, perhaps, will go with Mr. FLEXNER all the way at once: everyone who has to do with medical education will be well advised to listen to what he has to say in his valiant effort to raise the profession to higher levels.

THE INTERPRETATION OF PULMONARY RÂLES.

IN the course of a survey of the Union of South Africa, undertaken by the Union Department of Public Health with the object of obtaining information about the incidence of tuberculosis among native races, attention was drawn to an interesting clinical condition known as "defective lungs." By this term is meant, in the great majority of cases, a condition in which characteristic fine, crepitant râles are detectable in the marginal areas of the lungs of natives who otherwise appear to be perfectly healthy. That it is of some importance is shown by the fact that it was detected in 2679 out of 76,534 natives recruited for work in the gold mines. The peculiar conditions of the Rand mining industry make it highly undesirable to employ any individual about whose pulmonary health there may be the slightest doubt, and these natives have hitherto been rejected by the mine medical officers. In view of the fact, however, that the last word as to the interpretation of physical signs has not yet been spoken, it was decided to conduct an investigation into the significance of these particular signs, and the results of this inquiry have been published by Dr. W. WATKINS-PITCHFORD and Dr. PETER ALLAN.[1]

The investigation was conducted with characteristic thoroughness. 111 natives were chosen as typical examples of this condition and were submitted to a complete physical examination. They were kept in hospital under observation for an average period of five days, pulse, temperature, and respiration records were made, the sputum and urine were examined, Wassermann and von Pirquet tests carried out, and radiographs taken of the chest. A complete clinical picture having thus been obtained, the individuals were then drafted to one of the mines. While on the mines the natives underwent special clinical examinations once a month, and at the end of the period of the experiment, varying from 6½ to 2 months, final examinations were made at which radiographs of the chests were again taken. Five months after the experiment was concluded the records of the subjects were examined to see whether any had developed tuberculosis or tuberculosis with silicosis. The data supplied in the paper are, as is usual in the publications of this Institute, very complete, and the conclusions drawn from them are of interest not only to the industrial medical officer but also to the general physician. It is concluded that these râles are a physiological peculiarity rather than a pathological manifestation. In some cases—28 per

[1] An Investigation into the Significance of Localised and More or Less Persistent Râles in the Marginal Areas of the Lungs of Apparently Healthy Natives. By W. Watkins-Pitchford and Peter Allan. Publications of the S. African Institute for Medical Research. 1924.

cent. in this series—they may possibly be due to demonstrable inequality in the movements of the two sides of the chest. But in all cases they are believed to be of pleural origin, due to abnormalities in the supply, distribution, or removal of the natural lubricating transudate of the membranes. They may coexist with tuberculosis or silicosis, but are not specially indicative or prognostic of these diseases. But they may, on the other hand, obscure the auscultatory signs of tuberculosis, and it is of paramount importance, therefore, that all labour recruits presenting this condition should be submitted to X ray examination.

While this investigation is of immediate importance to the Rand mining industry, its general significance should not be lost sight of. Until it is possible to record physical signs in the same way as it is possible to record a pulse tracing, or to demonstrate abnormalities in the renal secretion, every physician must judge for himself the degree and extent of abnormal pulmonary and cardiac sounds. He must establish for himself the standards by comparison with which he may determine the significance of physical signs. He is, in fact, himself the variable, the experimental, or instrumental error in the observation of his patient, and it is only by careful and controlled work that he can so reduce the margin of error as to raise his technique from an art to a science.

THE NEW PUBLIC HEALTH BILL.

A MONTH ago the Minister of Health announced in answer to a question in Parliament that he hoped to introduce a Public Health Acts Amendment Bill on the lines of the legislation of 1890 and 1907, embodying for the benefit of the whole country various provisions at present contained only in local legislation. The Government Bill is known to be in an advanced stage of preparation, but there is scant hope of its introduction this Session. Fortunately a private Member's Bill, drafted with a similar object, has turned to good account the opportunity of a Friday afternoon debate; at the end of last week it secured an agreed second reading with the assent of all parties, the support of the Association of Municipal Corporations, and the blessing of the Ministry of Health. Mr. WOMERSLEY'S Bill, the terms of which are outlined this week by our Parliamentary Correspondent, will do three excellent things. It will lighten the burdens of progressively-minded ratepayers, who will no longer have to pay the heavy cost of promoting special legislation to obtain the public health facilities which other local authorities enjoy; it will ensure a measure of administrative uniformity throughout England and Wales; and it will save valuable Parliamentary time. We have more than once commented on the repeated recommendations in the annual reports of the Local Legislation Committee in favour of the passing of such a Bill. One other admirable consequence will be the fact that the way will thus be cleared for the re-casting of our public health law into a single, orderly, comprehensive, and comprehensible code,—a matter which the then Minister of Health admitted to be of urgent importance two years ago. It is almost inconceivable to think that our principal legislation on the subject was passed as long ago as 1875, and that it has undergone no substantial revision in the past half century, though both the central and the local authorities have been altered, though research has enlarged our powers of preventing disease, and though a constant increase in public interest has made acceptable a general improvement in health standards. It is gratifying that Sir KINGSLEY WOOD was able to state on Friday last that, if Mr. WOMERSLEY'S Bill were placed upon the statute-book, the Government would produce a further amending Bill, probably in 1926, and would then propose consolidation of the whole law.

Meanwhile Mr. WOMERSLEY'S Bill should be regarded as a valuable instalment. Its prospects must not be obstructed. Like every other Bill, it is open to criticism. Those who fear the extravagances of municipal socialism have already noted Clause 61, whereby local authorities which possess slaughter-houses or markets are to be allowed also to possess refrigerators, and to make reasonable charges for cold storage. Critics on the other side will complain that the Bill does not go far enough. Those who care to pick up a modern Local Act and to scan the elaborate clauses which the ingenuity of Parliamentary agents has multiplied, can make a list of the fashionable provisions which Mr. WOMERSLEY'S Bill omits to include. He would, for example, allow local authorities to put up drinking fountains, but not to put up seats for the weary. He includes clauses for dealing with disease in common lodging-houses, and clauses against offensive trades, against nuisance from occupation of tents and vans in unsuitable places, and against verminous premises, articles, and persons. He does not include other clauses which are common form in modern local legislation—the power to close Sunday schools in times of epidemics, the power to regulate ice-cream manufacture and sale, the power to make by-laws for better inspection of meat, and the power to prohibit persons from selling food who are suffering from advanced tuberculosis. Criticism on these lines, however, is neither fair nor reasonable. The Bill, neatly as much of it is drafted, will doubtless be improved in Committee; but it is better to obtain a legislative instalment in the form of the greatest common measure of agreement than to lose the Bill by concentrating on points of difference. The general scheme of the Bill is permissive. This fact in itself should disarm hostility.

HIGH MATERNAL MORTALITY: RESOLUTIONS BY THE MIDWIVES' INSTITUTE.

AT the last annual general meeting of the Midwives' Institute the following resolutions were passed:—

1. That there should be a post-mortem examination, by a duly appointed pathologist, on every woman who dies in childbirth, unless otherwise disallowed by a competent official. If the post-mortem examination did not reveal the exact cause of death, the coroner should be communicated with and further medical investigation should be made.

2. That the Ministry of Health should be asked for uniformity in the notification of births card, which should have a special place for the name of the person who actually delivers the woman.

3. That the Ministry of Health be asked to request the medical officers of health in their annual reports of puerperal mortality to distinguish between those cases in which a *midwife* was engaged, and those cases in which a *doctor* was engaged to attend.

The objects of the three resolutions will commend themselves to our readers. First, the desirability of an autopsy to clear up the pathology of an unexpected, unusual, or sudden event is common to the whole practice of medicine; secondly, infringements of the Midwives Act should be provided against; and, thirdly, any connexion between high mortality and the working of that Act should be made clear. At present the facts demanded by the third resolution can be ascertained only from certain of the annual reports of medical officers of health.

Annotations.

"Ne quid nimis."

THE BATEMAN FUND.

WE publish this week the new subscriptions to the Bateman Fund, and are encouraged to bring the salient points of the appeal before our readers by the following letter which we have received, signed "A. Morse, Staunton-street, Deptford," and "written in the name of Dr. Bateman's patients and friends." Mr. Morse, addressing the Editor of THE LANCET, writes: "We all feel we cannot thank you enough for sending him (Dr. Bateman) back to us so soon. We, the people of Deptford, know what a valuable friend he has always been to the poor. He is called here the poor man's Doctor. We have read and heard how you are subscribing to help Dr. Bateman in his heavy expenses for his trials. God bless you and the medical profession for their loyalty and kindness to him." We have had many letters from members of the medical profession approving our action in opening this Fund, from which we might, with excusable gratification, have extracted sentences for publication, but it is particularly desirable that readers should understand that, in our view, the appeal was *necessary* and not the outcome merely of sympathy in a particular case. This is the reason why the appeal was made. The medical man, and especially the general practitioner, in the course of his business must often find himself in a position of the gravest anxiety, when the procedure that he adopts, his actions, or it may be his inactions, can be placed before a jury of laymen in the wrong light. It is needful, and increasingly needful, that such disasters should be made as rare as possible. The pecuniary risk in such circumstances can be avoided for practitioners by subscription to one of the two excellent Defence Funds, and over and over again we have urged upon our readers to shelter themselves from unavoidable risks. Many of those who have followed the Bateman case must have been led to take this advice, and we bring before them the position of Dr. Bateman as one worthy of their help, if only because his misfortune has stimulated them to obtain security.

INTRATHECAL MEDICATION IN MENINGITIS.

THOUGH the need for drainage and the efficacy of intrathecal medication in certain forms of meningitis are unquestioned, the attempt to administer serum is often abandoned if lumbar puncture is for any reason unsuccessful. Dr. C. Worster-Drought, in the article which appears in our present issue of the series entitled Modern Technique in Treatment, points out that even where lumbar puncture fails through the presence of adhesions or through the progressive thickness of the pus, the subarachnoid space may be drained and the appropriate serum administered through other regions. Puncture in the thoracic region is not advisable, since in many normal individuals a posterior subarachnoid space is absent in this region, owing to adhesions between the meninges and the posterior aspect of the spinal cord. But cervical, cisternal, sphenoidal, or ventricular puncture are possible avenues of approach, of which the first, at any rate, has led to successful results in cases of cerebro-spinal fever, reported by several observers, including Cantas and Gerard and Dr. Worster-Drought himself. It is essential to gain access to the subarachnoid space for the application of a specific immune serum, since the full power of the latter can only be exerted when brought into contact with the infecting organisms in a concentrated form. For the actual meningitis, serum injected subcutaneously or intravenously is of little value; not only does it undergo an extremely high dilution in the blood-stream, but there is no evidence that it ever reaches the subarachnoid space. Although the lining membrane of the subarachnoid space is permeable to substances passing from the cerebro-spinal fluid to the blood, it appears quite impermeable, except in the case of a few drugs (e.g., hexamine), from blood to cerebro-spinal fluid. On the other hand, the absorption of antibodies from the subarachnoid space is fairly rapid, serum injected intrathecally appearing in the blood within 10 minutes[1] and disappearing entirely from the cerebro-spinal fluid within 24 hours.[2] Dr. Worster-Drought throws doubt on the practical value of hexamine by the mouth in cases of meningitis. It has been given as a routine on theoretical grounds; but though it is certainly one of the few drugs to be even partially excreted by the cerebro-spinal fluid, it must reach the subarachnoid space only in extremely high dilution. Moreover, hexamine dissociates only in an acid medium and the cerebro-spinal fluid is rarely, if ever, acid, even in cases of meningitis. He is probably right in considering the therapeutic action of this drug on the cerebro-spinal fluid as negligible.

THE MIND OF THE MINER.

THE discontent among coal-miners is no post-war affair. The coal trade has been for years in a condition of unrest. Any industrial psychologist who could offer constructive suggestions as to how to make conditions of this work less uncongenial would place the community as a whole deeply in his debt, for in this country the mining industry is more fundamental even than that of agriculture. In an article in last month's *English Review* Mr. James A. Bowie sets out fairly the attitude of owners on the one hand, and miners on the other, and seeks to account for that bellicose mental condition of the worker which appears to be an undeniable factor in the industry. He points out that from 1904–13 the average annual percentage of workers in the coal industry, involved in disputes entailing loss of work, was 21·4; next to these came the textile industry with only 6·4 per cent., while the mean average of all trade groups was 4·4. Since the Armistice matters have been worse; in 1920 and in 1921 national stoppages occurred; in 1922 over one million and a quarter working days were lost due to local disputes, and in 1923 the amount was only slightly less. Yet there has been less unemployment in recent years in this industry than in any other, for in December, 1922, the percentage of unemployed among miners was 4·6, as against 12·2 in all trades, the corresponding figures for 1923 being 2·4 and 10·7. Although coal-mining must for a variety of reasons, such as lack of sunlight, accident risk, and dust and dirt, be an unpleasant occupation, it is not, comparatively speaking, an unhealthy one. The general mortality is not unfavourable, and, according to the Occupational Decennial Supplements issued by the Registrar-General, has been falling steadily, as have also the rates for the chief causes of death among miners. In gold-mining countries silicosis takes a heavy toll, but the Secretary for Mines stated recently in the House of Commons that though the alleged prevalence of silicosis among coal-miners in this country has been under consideration by the Health Advisory Committee for about two years, the evidence so far laid before the Committee is quite insufficient to justify any recommendation in respect of compensation. The fear of silicosis, then, in this country can hardly be a factor conducive to unrest. Moreover, during recent years the accident mortality-rate in mines has continued to fall from 1·6 per 1000 in 1913 to 1·4 in 1918 and to 1·1 in 1923. At the same time, judging from statistics supplied in the House of Commons on Feb. 24th, great mining disasters have been fewer in number and have claimed fewer victims.

Such records must present a difficulty for any medical sociologist who holds that social unrest is an expression of social ill-health. According to Prof.

[1] As shown by Debré with the sensitive precipitin reaction for a foreign serum. (Thèse de Paris, 1911.)
[2] Hohn, Klin. Jahrbuch, 1909, xx., 377.

E. L. Collis (*Western Mail*, Jan. 21st, 1924), the records within the industry itself show some confirmation of this theory. Mortality records vary widely on the different coal-fields; during over 30 years the comparative mortality-rates for Lancashire and for South Wales have been nearly double those for Nottingham and Derbyshire, and he points out that on all recent occasions, when ballots of the miners have been taken, the greatest unrest has been revealed in Lancashire and South Wales, and the least in Nottingham and Derbyshire. Mr. Bowie suggests that a "dungeon complex," comparable to the "prison complex" of the factory hand, is present in the subconscious mind of those who toil in darkness amid dirt and dust. Support for such a line of argument comes from the existence among coal-miners of a disease peculiar to them—nystagmus; a disease which, while it prevails directly as illumination in pits diminishes, is recognised to possess a pronounced neurasthenic basis. As coal-mines are steadily being deepened, danger from mine gases increases; hence the use of safety lamps, which give less illumination than naked lights, has been rapidly on the increase. Thus in 1907 there were about 600,000 safety lamps in use, while in 1923 there were over 900,000. The solution of problems existent in the miner's psychology may possibly be found closely associated with the raison d'être of miners' nystagmus. This thought is worth pursuit, for provision of better illumination in our coal-mines would seem to be a simpler expedient than many of the economic and administrative proposals which to-day are vaunted.

INFECTIOUS DISEASES IN SCHOOLS.

THE closure of any school on grounds of infectious disease is usually resented by parents, since the responsibility for watchful care and possibly for isolation is thrust on them. Their resentment is increased if they believe economic considerations to be a factor in the decision to close down. Headmasters of private preparatory schools who are tempted to spare themselves anxiety by packing off the children even a few days before the end of any term know well that they will not escape abuse unless the step is taken on the urgent representation of the medical officer in charge. It is the latter, therefore, who is usually made responsible for a decision and should prepare himself by mastering the complicated issues involved. An attempt to obtain guidance by studying the procedure adopted in schools not run for profit shows him that here financial considerations have been an important factor in the decision, since grants from the Board of Education depend on the maintenance of good average attendances throughout the term. To run the school with a bad attendance sheet for any reason is to run it at serious economic disadvantage. New regulations, however, have just been issued whereby local authorities will, in future, be secured from loss, if the low attendance is due to the prevalence of infectious disease, and closure of primary schools will only be allowed strictly on medical grounds. These regulations are set out in a memorandum[1] addressed to medical officers of health and school medical officers. Published under the joint auspices of the Ministry of Health and the Board of Education, the memorandum includes a theoretical discussion of the principles involved as well as specific rules for action in particular diseases, and will doubtless be welcomed by medical officers attached to every type of school. It is a new edition of a pamphlet first issued in 1909, and reaffirms the principle, then laid down, that if, during epidemics of infectious disease, the power to exclude individual children from school be used to the best advantage, it is only in special and quite exceptional circumstances that it will be necessary to close a school in the interests of public health. There will, indeed, be no temptation in the future for local education authorities to close down on any other grounds, since security against loss of grant is assured to secondary as well as primary schools.

The mode of procedure recommended is carefully set out in the memorandum, and the medical officer of health is advised in certain cases to act, not as such, but as school medical officer, since he has greater powers in the last-named capacity. Incidentally, it is again urged that these two offices should be held by the same person. The general effect of the new regulations is as follows: (*a*) Schools or departments may be closed or individual scholars excluded by the Sanitary Authority or by any two members thereof acting on the advice of the medical officer of health. (*b*) Schools or departments may be closed for medical reasons by the Local Education Authority acting on its own initiative—i.e., without orders from the Sanitary Authority—but the closure must be advised or approved by the school medical officer on the ground that such closure is needed for medical reasons. (*c*) Individual children may be excluded from school by the school medical officer (without special authorisation by the Local Education Authority in each individual case) provided that the Board are satisfied that proper arrangements have been made by the Local Education Authority for this purpose. Generally speaking, the advice given in that part of the memorandum which deals with specific diseases is admirably complete. The omission from the discussion of diphtheria of any reference to the Schick test will disappoint those who will look for a critical estimate of its value in these pages. The recommendation that cases of influenza should not be readmitted until a careful examination of the heart and lungs has been made to eliminate possible latent complications is a counsel of perfection. There can hardly be a school medical officer who would put such a proposition before his Authority during an epidemic, considering what the risks amount to and what the cost would be. The remarks under the heading Acute Poliomyelitis should receive strict attention. It is emphasised that a careful watch should be maintained in non-paralytic cases for the supervention of paralysis, as recurrent cases occur in which the paralysis is manifested after acute symptoms have subsided. Paralytic cases require a long period of school exclusion and are afterwards better treated, if practicable, in special orthopædic institutions. In such cases early care and educational measures maintained over a prolonged period may prevent or at least mitigate crippling. Recommendations for the care and after-care of children suffering from encephalitis lethargica conclude the memorandum. Children exhibiting signs or symptoms suggestive of a mild or abortive form of encephalitis lethargica should, it is said, be kept from school for a minimum of six weeks. Six months from the time of exclusion from school is suggested as the earliest period at which a child who has had encephalitis lethargica may return to work; in many cases this period has to be extended to a year or longer. So little is known about the epidemiology of this disease that more concrete advice is not to be expected.

[1] Memorandum on Closure and Exclusion from School. H.M. Stationery Office. 1925. Pp. 32. 4*d*.

THE VISIT OF FOREIGN PUBLIC HEALTH OFFICERS.

THIRTEEN nations have during the last few weeks been represented by their foreign public health officers in an official visit to this country under the auspices of the League of Nations.[1] The representatives visited certain typical selected centres, such as Leeds and a Yorkshire district, the borough of Wolverhampton, a large suburban borough, and various areas in the counties of Middlesex and London, and under the auspices of the local officials were given full information as to national and municipal public health organisation. The visit concluded at the beginning of this week, when the representatives left for Geneva, there to present a report to the League.

[1] THE LANCET, Feb. 14th, 1925, p. 354.

and its termination was marked by a luncheon given to them by the Government, over which Sir John Gilmour, Secretary of State for Scotland, presided. The luncheon was not allowed to offer opportunity for many or long speeches, but in proposing the health of the visitors Sir John Gilmour struck a note that was acceptable to the company and would be received with acclamation by any thinking audience, when he said that all persons of intelligence were looking anxiously to a peaceful settlement of the world, and that preventive medicine furnished a means for mutual development and intercomprehension between all nations. Dr. M. D. Horst, the representative of Holland, replied for the visitors, and while acknowledging the pioneer part played by Great Britain in health organisation and extolling the extent to which multiple activities were ranged under the common title of Health Department, raised laughter by saying that this country appeared to pay no special regard to the value of vaccination. The company, however, warmly applauded his further remarks founded on personal observation of the value of vaccination. The luncheon took place at the Carlton Hotel, London, W.

THE SEASONAL PREVALENCE OF DISEASE.

PERIODICITY is one of the interesting phenomena in epidemiology, and a study of the causes of cyclic tendencies of disease discloses fundamental factors of importance. To be able to elucidate the laws which govern these periodic eruptions is to be able to presage their advent and to formulate measures for preparedness and prevention, and to this subject Dr. M. J. Rosenau made a valuable contribution in a paper read at the International Conference on Health Problems in Tropical America.[1] Pandemics of influenza have been quite irregularly spaced. Measles, again, is a disease which tends to recur in a cyclical manner with considerable regularity. In the endemic regions exacerbations recur every two or three years. The explanation appears to depend upon the accumulation of a new crop of susceptible children. Infantile paralysis in Massachusetts displays a sort of regularity in its tendency to an excessive prevalence about every fourth season. These epidemic recurrences are followed by a regular decline until the next period. Despite the vagaries and uncertainties of this disease, we do know that, as long as the disease prevails, there will be more of it in the summer-time than in the cold season.

A good instance of the uncertain manner in which epidemic diseases recur is shown by the visitations of plague in London from 1563 to 1680. Consequently, plague is one of the diseases which have become stamped upon art, science, and literature. Plague was raging in Stratford-on-Avon when Shakespeare was a baby. Another example of irregular periodicity is shown by the story of diphtheria epidemics in Boston, New York, and Chicago, but within recent years such epidemic outbreaks have not taken place and the disease should never again be allowed to get out of hand. Many diseases recur annually with the regularity of perennials. However, seasonal prevalence of disease may to a certain extent be violated when a communicable infection is introduced into a virgin population. But on the other hand, when certain contact diseases which prevail especially in the winter season in temperate latitudes are introduced into the tropics, they have a tendency to die out; thus scarlet fever has never gained a foothold in tropical countries, and measles and diphtheria do not, as a rule, become serious problems under the vertical rays of the sun. Yet influenza, pneumonia, and tuberculosis play havoc in tropical lands just as they do in temperate zones. The effect of latitude is striking and significant; thus rheumatic fever reaches its highest incidence in March and April in the United States, but in September and October in England. A number of diseases show two peaks of incidence, one in the spring, the other in the autumn. This is frequently the case with the acute respiratory and throat infections, but also with tuberculosis, nephritis, and rheumatism. The causes of seasonal changes in health and disease are varied, complex, and largely undetermined. The insect-borne group of diseases prevail almost entirely during the summer-time—that is, during the hot, moist season of the year when the insect vectors most abound. These insect-borne diseases give us the best examples in epidemiology of endemicity. We have, therefore, no record of an epidemic of yellow fever in the winter season.

An exception to the rule is typhus fever, which prevails in winter-time, but subsides with the warm weather. This paradox is, however, easily explained by the fact that lice are more common in cold weather. There is evidently some factor in the bionomics of the louse which makes cold weather favourable for the completion of the cycle of events. Malaria may, however, occasionally be more prevalent in winter than in summer. An instance of this has recently been reported from Russia in the winter of 1922–23, where an epidemic spread steadily throughout the winter with the thermometer varying from 20° to 30° C. below zero, the spread of the disease being apparently due to the fact that the butts of drinking-water in the almost tropical heat of the log houses of the peasants afforded ideal breeding-places for the anopheles. The seasonal prevalence of the intestinal diseases has a general resemblance to that of the insect-borne infections. This is the case with typhoid fever, cholera, dysentery, and the summer diarrhœa of infants. The incidence and intensity of these infections become greater as we approach the tropics. Winter-borne outbreaks of intestinal infections frequently occur. Water-borne typhoid fever has a predilection for the winter season. When cities like Albany, Philadelphia, and Chicago improved their water-supplies the typhoid fever rate became markedly lower and the seasonal prevalence was reversed.

The importance of the seasonal prevalence of disease is further emphasised by the fact that such diseases as poliomyelitis and encephalitis lethargica, which in Britain have their period of maximum incidence in the late summer and autumn and in the winter respectively, occur under reversed conditions in Australia, where poliomyelitis is a disease of the first half of the year, and encephalitis of the third and fourth quarters. This point was mentioned by Dr. A. K. Chalmers, medical officer of health for Glasgow, in the course of the Watsonian lectures delivered recently to the Royal Faculty of Physicians and Surgeons of Glasgow.

[1] International Conference on Health Problems in Tropical America, United Fruit Company, 1924, pp. 28–54.

THE CARE OF CRIPPLED CHILDREN.

THE County Borough of Portsmouth has found a happy solution of the problem of how to deal with the crippled children in its district. At a meeting in Portsmouth Town Hall on March 20th the Mayor, Councillor F. Privett, was enabled to hand over to the trustees of the Lord Mayor Treloar Hospital for Cripples, Alton, a cheque for £10,000, raised by voluntary subscription, in return for which the trustees have agreed to set aside 50 beds in perpetuity for the treatment of the young cripples of Portsmouth. It is little over a year ago that certain citizens of the borough decided to raise a fund in order to provide treatment for the town's crippled children. The first idea was to erect a small orthopædic hospital on the outskirts of the town; further consideration, however, showed that the money could be more advantageously expended by endowing beds in an existing institution. As a result of this decision the trustees of the Hospital at Alton were approached and agreement was arrived at. By a trust deed the Portsmouth Corporation have now allotted to them 50 beds for which they pay a maintenance charge of 30s. a week. The

surgical staff of the Hospital, whose original efforts took cognisance mainly of crippling caused by tuberculosis, has been extended to cope with different forms of orthopædic work, and the crippled children of Portsmouth up to the age of 16 years, no matter to what cause the infirmity may be due, can now secure at Alton whatever treatment, surgical or otherwise, may be necessary. The agreement has received the cordial approvement of the Ministry of Health and Board of Education, and the procedure adopted by Portsmouth is one which, provided the trustees of the Treloar Hospital were agreeable, might well be followed by local authorities in the locality. Other counties might well consider the advantage of similar centres in their midst, and make the development possible by financial support. Education authorities must shortly make provision for the crippled children of their districts, and to attempt to do this by the erection of small *ad hoc* hospitals will not only prove expensive but, what is still more important, such a course can never secure for their patients the efficient treatment which is available at a large institution capable of engaging a highly specialised surgical and medical staff.

OXALURIA.

Calcium oxalate is a normal constituent of the urine, but in conditions of health the amount is small, between 15 and 20 mg. being excreted during 24 hours. Upwards of 30 mg. may be considered as pathological, though this quantity may not cause any definite symptoms. Its solubility in the urine is small and varies with the reaction, for in very acid urine probably the normal quantity present is completely dissolved; but in amphoteric, alkaline or even slightly acid urines only a minute trace goes into solution, the remainder being passed as crystals. Oxalic acid is produced from a large number of substances in the human body—for example, from the carbohydrates by oxidation, from protein and nucleo-protein by breaking down of their complicated structure, and even from fats and allied substances such as glycol. In addition, oxalic acid and its salts are present in varying proportions in many common foodstuffs, amongst which the following are examples—spinach, rhubarb, sorrel, gooseberries, strawberries, beetroot, cocoa, tea, and chocolate. Briefly, the sources of oxalic acid formation in the human body during the processes of digestion are very numerous. There is one additional fact of physiological importance—viz., the relatively greater solubility of magnesium oxalate than the calcium salt, for the suitable administration of magnesium salts in the diet can increase the amount of oxalate excreted, and so diminish the tendency to oxaluria.

The surgical manifestations of oxaluria are not realised, and Mr. Bathe Rawling was able to collect an interesting array of facts and warnings in his paper to the Medical Society of London on Monday evening. He dealt first with that group of cases in which the oxaluria produces an abdominal condition, which may be, and has been, diagnosed as acute intestinal obstruction. Mr. Rawling's first patient, manifesting this condition, was his own house surgeon, who was suddenly seized with abdominal pain accompanied by vomiting, abdominal distension, and complete constipation. The patient was seen by Sir D'Arcy Power and Sir Anthony Bowlby as well as by Mr. Rawling. All agreed that acute intestinal obstruction was present and a laparotomy was performed with a negative result. The next day, the patient having shown no improvement, a general surgical consultation revealed a unanimous opinion that acute obstruction was still present, and a second exploration was advised. Fortunately the patient passed small quantities of flatus, and enemata now succeeded in producing admirable results, a second operation becoming unnecessary. The urine was later found to be smoky with blood and heavily laden with oxalate crystals, and later a small calculus was passed. Quite soon after Mr. Rawling saw a second example, again in a medical man, who presented a very similar clinical picture, but the condition was diagnosed without operation. The noticeable feature in both cases was that the patients neither felt nor looked as ill as they should have done if their trouble had really been acute intestinal obstruction. Furthermore, in the first case the patient was convinced that the paralytic condition of the intestine was largely due to a dose of morphia. These cases Mr. Rawling cited as examples of acute abdominal manifestations accompanying oxaluria, but there are other and more numerous examples of chronic intestinal disturbances due to the same cause. They may be somewhat vividly described as "windy" patients, who suffer from recurrent attacks of abdominal pain with distension, neither very severe but of sufficient intensity to make the patient seek advice. The explanation suggested by Mr. Rawling is that there is a reflex disturbance of the sympathetic nervous system controlling the intestines from the renal nerves. The existence of such abdominal manifestations calls attention to the great importance of a routine examination of the urine, and further it must be realised that the general condition of these patients is not consistent with the diagnosis of acute intestinal obstruction. Apart from the well-recognised group of patients who suffer from hæmaturia due to oxaluria, there is one other surgical condition found at times complicating an excess of oxalates in the urine, and that is a urethral discharge, which may vary from a slight mucous stickiness to a frank muco-purulent discharge. The importance of this class of case cannot be overestimated, for the obvious mistake in diagnosing gonorrhœa may have disastrous effects to both patient and surgeon. Sir William Willcox, in the course of the same debate, dealt with the physiological source of the oxalates and the treatment of their excess in the urine, and in doing so afforded a well-timed warning that the presence of calcium oxalate crystals does not necessarily entail oxaluria, and that such grave conditions as had been mentioned can only be attributed to oxaluria in the absence of definite evidence suggesting other more obvious lesions. He recommended careful dieting by excluding all those foodstuffs known to be rich in oxalates, by choosing foods rich in magnesium, by avoidance of hard drinking waters, and the establishment of a proper hygienic habit of life.

A SOCIAL evening will be held by the Royal Society of Medicine at 1, Wimpole-street, London, W., on Monday, May 4th, when Dr. Robert Hutchison will give an address on "Dr. Samuel Johnson and Medicine," illustrated with 18th century portraits.

THE announcement was made last week, as these pages were in the press, that Sir Humphry Rolleston, in accordance with universal expectation, has been appointed to follow his old friend Sir Clifford Allbutt as Regius Professor of Physic in the University of Cambridge. On every ground the appointment has been hailed with satisfaction.

ROYAL COMMISSION ON NATIONAL HEALTH INSURANCE.—The twenty-second meeting of the Commission was held at the Home Office, Whitehall, on March 19th, Sir Andrew Duncan in the chair. The examination of Sir Norman Hill, Bart., on the working of the Seamen's National Insurance Society was resumed and at its conclusion he gave evidence as to the special fund for seamen. Thereafter the Insurance Committees of Coventry (Mr. H. W. Wale and Mr. Lee Gordon), Cheshire (Mr. G. Wright and Mr. F. T. West), and Leicestershire (Alderman Goodacre and Mr. T. Crew) gave evidence on the constitution and administrative work of insurance committees, particularly with reference to the medical and treatment benefits. The Commission announce that proof copies of the oral evidence and the relative statements submitted at the meeting of March 5th are now on sale at H.M. Stationery Office (2*s.* 3*d.*).

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CXV.—THE TREATMENT OF MENINGITIS.

THE prognosis in acute and subacute leptomeningitis varies according to the organism responsible for the infection. Cerebro-spinal fever (meningococcal meningitis) is by far the most hopeful as regards response to treatment, but many cases of recovery have now been reported in the pneumococcal, streptococcal (especially of otitic origin), and influenzal (*B. pfeiffer*) forms of meningitis, as well as in that due to various other organisms. Even in tuberculous meningitis, which has the worst possible prognosis, some 46 authentic cases of recovery are recorded in the literature.

General Management.—Careful nursing is of paramount importance. The patient's head should be kept fairly low, not more than one pillow being allowed; sitting up is not permitted. Unconscious patients must be turned frequently, since hypostasis is a predisposing factor in the development of pneumonia In cases running a course of longer than ten days a water-bed should be provided to obviate bed-sores. The patient must not be allowed to suffer from retention of urine; if necessary, the catheter must be used twice daily.

Diet.—In acute cases, milk, beef-essences, cocoa, and lemonade are given. If vomiting is present, four-hourly feeds consisting of 5–15 oz. of citrated milk (sod. cit to gr. 2 per oz. of milk) diluted with an equal par of water are often kept down. Peptonised milk whey, and albumin water are also useful. In cases recovering, semi-solids—custards, bread-and-milk, eggs, under-done mutton—should be given as early as possible. Infants suffering from posterior basic meningitis should be breast-fed if possible.

Bowels.—Constipation is the general rule. Calomel or castor oil may be given at night, followed by a saline purge next morning. Liquid extract of cascara and compound liquorice powder are also useful, but enemas are frequently required.

Vomiting.—To allay mild vomiting not due to hydrocephalus, the following mixture is often helpful: ℞ Acid hydrocyanic dil. ℥4, liq. morphinæ hydrochlor. ℥10, sodii bicarb. gr. 10, aq. chloroformi ad ℥ i., t.d.s. The most efficacious measure for the prevention of vomiting, however, is repeated daily lumbar puncture (vide infra).

Headache.—Cold applications are beneficial. Phenacetin (gr. 12) with caffeine (gr. 2) may be given twice or three times daily.

Sleep, &c.—Sulphonal (gr. 20–30) is often useful. For obstinate insomnia, or when continued delirium with restlessness is present, morphine (gr. ¼) should be administered hypodermically and repeated if necessary. When morphia fails, potassium bromide (gr. 15–25) sometimes gives good results. Paraldehyde is of little value in meningitis, and hyoscine should be avoided. Warm sponging and occasional warm packs are also of help.

Should symptoms of cardiac failure or a falling blood pressure develop, hot saline infusions (T. = 100° F.) should be given rectally or subcutaneously in the pectoral regions, together with digitalin (gr. 1/100). Strychnine, owing to its tendency to precipitate convulsions, is contra-indicated. Cases recovering should remain in bed at least 14 days after the termination of the course of disease. Patients recovering from cerebro-spinal fever should sniff a solution of 1 per cent. chloramine into the nose twice daily in order to sterilise the naso-pharynx; relapses may be due to a reabsorption of meningococci from this situation.

Special Treatment.

Two principles are important. (1) The establishment of adequate drainage for the meningeal exudate; (2) the application of a specific immune serum in as close contact as possible with the inflamed tissues.

Drainage.—Adequate drainage can usually be supplied by the performance of repeated daily lumbar puncture. Since 1916, more especially in cerebro-spinal fever, my routine practice has been to follow a period of intrathecal serum administration by repeated daily lumbar puncture, with complete drainage of the subarachnoid space, until the cerebro-spinal fluid becomes clear to the naked eye. With this method I have encountered no recrudescence nor relapses. When no cerebro-spinal fluid is obtained by lumbar puncture ("dry-tap") by reason of adhesions existing between the meninges and spinal cord at a higher level or a progressive increase in the density of the pus, one has to consider puncture at other sites.

Cervical Puncture.—Puncture of the theca below the seventh cervical vertebræ I have found quite a safe procedure provided the needle is inserted without a stylet.[1] Puncture in the thoracic region is not advisable, as in many normal individuals a posterior subarachnoid space is absent in this region.

Puncture of the Cisterna Magna.—The technique of cisterna puncture is as follows: With the patient prone and his forehead supported, the needle (graduated in centimetres) is inserted directly over the spine of the second cervical vertebra, the point being directed upwards in the mid-line at an angle of 45°. The needle pierces the occipito-atlantal membrane between the occipital bone and atlas, and reaches the cisterna magna at a depth of 4 to 6 cm. This method of puncture is indicated when no fluid can be drained off at any lower level. Occasionally, when purulent exudate occludes the region of the foramen magnum, even this puncture may fail in its object.

Sphenoidal Puncture.—If the above measures are unsuccessful, sphenoidal puncture—after the method of Bériel and Cazamian—may be tried. This consists of introducing a needle 2 mm. external to the supra-orbital notch, upwards and inwards along the outer wall of the orbit in its upper part, and entering the most external portion of the sphenoidal fissure.

Ventricular Puncture.—In children with open fontanelles, puncture of the lateral ventricle is easy and may be resorted to at once if lumbar puncture fails to yield fluid. The needle is introduced at the lateral angle of the superior fontanelle, the direction being downwards, slightly backwards and inwards to a depth of 3 cm. In older children and adults, the usual method of draining the lateral ventricles is to trephine, a procedure which causes considerable "shock," especially as it is necessary to operate on each side. The patient seldom survives, and this operation should not be considered unless the patient's condition is almost desperate.

More recently, instead of trephining, I have merely drilled a hole through the skull over Keen's point and punctured the ventricle through the small opening thus made. In most cases it is possible to perform this operation without an anæsthetic, the "shock" is negligible as compared with that resulting from a trephine, and drainage appears equally effective. Two cases of apparent internal hydrocephalus complicating meningococcal meningitis treated by this method recovered.

As regards meningitis secondary to otitis media or other local infection, an attempt should be made to remove the original septic focus and to establish free drainage of the subarachnoid space. In otitic meningitis the translabyrinthine method of drainage has resulted in several recoveries.

Administration of Serum.

In order to exert its maximum effect, serum must be introduced directly into the subarachnoid space and must be renewed at intervals not exceeding 24 hours. When there is evidence of systematic infection, the intrathecal medication should be

[1] Jour. Neurol. and Psychopathol., 1921, i., 216.

supplemented by the intravenous administration of serum in doses up to 200 c.cm. Herrick, indeed, advises doses up to 600 c.cm., the resulting serum-sickness being no more severe than with smaller amounts. Anti-meningococcal, anti-pneumococcal and anti-streptococcal sera are available for the respective forms of meningitis. Also, for the very rare cases of meningitis due to *B. typhosus* and *B. dysenteriæ*, we have anti-typhoid and anti-dysenteric sera. The serum should be polyvalent for the specific organism obtained from the cerebro-spinal fluid and is administered at the earliest possible moment. Later, if the actual type of organism is determined in the case of the meningococcus or pneumococcus, the corresponding univalent serum can be substituted.

Method of Administration.—The usual method of introducing serum into the subarachnoid space is by puncture in the lumbar region, from which situation it quickly reaches the ventricles.

Following the evacuation of cerebro-spinal fluid in any region, the serum is injected either with a syringe or run in from a small funnel and tube—the last-named method being safer. The end of the bed should be raised for half an hour following the serum administration. For the performance of lumbar puncture and intrathecal injection, a general anæsthetic is only necessary when the patient is particularly restless or violent. In restless cases a hypodermic injection of morphine (gr. ¼) and atropine (gr. 1/100) given 20 minutes before the puncture will assist in keeping the patient calm.

Dosage of Serum.—The initial dose of serum is from 30–50 c.cm., followed by 30 c.cm. daily for at least four days or until clinical improvement is manifest. The quantity of serum injected should, however, be at least 5 c.cm. less than that of the cerebro-spinal fluid withdrawn. To children the following doses may be given: 1–5 years, 5–15 c.cm.; 5–10 years, 10–20 c.cm.; 10–19 years, 20–40 c.cm. However great the patient's improvement may appear, serum injections should be continued until no more organisms are present in stained films of the cerebro-spinal fluid deposit. After this period repeated daily lumbar puncture is advisable until the cerebro-spinal fluid is clear to the naked eye. At each puncture the fluid is allowed to escape until the flow practically ceases. Should signs of a recrudescence appear the injection of serum must be resumed; if the period since the last serum administration exceeds eight days anti-anaphylaxis must first be induced.

Other Methods of Treatment.

As regards other forms of meningitis for which no specific sera are available, it is best to rely on general treatment and the performance of repeated daily lumbar puncture. In very acute cases puncture may be performed at first every 12 hours. The introduction of chemical substances—lysol, protargol, flavine, hexamine, &c.—directly into the subarachnoid space is not to be recommended, nor have I observed any benefit result from attempts to wash out the intrathecal space with saline solution.

It is usual to prescribe hexamine (gr. 10, t.d.s.) by the mouth in all cases of meningitis. It is, however, of doubtful value. Recently Maloens[1] has advocated the intravenous injection of an iodo-urotropine preparation in septic meningitis, each injection being preceded by lumbar puncture. Vaccines are applicable only to subacute and chronic cases, and cerebro-spinal fever and tuberculous meningitis are the only two forms which exhibit such stages with any degree of frequency. In the former, an autogenous vaccine may be given, starting with a dose of 200 million organisms and increasing by 200 or 250 millions per dose every fifth day up to a maximum of 2000 millions. The reactions with these doses are negligible.

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[1] Bruxelles Méd., Nov. 16th, 1924.

Special Articles.

THE ACTION OF WATER UPON COPPER PIPES.

BY JOHN C. THRESH, M.D. MANCH., D.SC. LOND., F.I.C., &c.

COPPER pipes have apparently been used on a limited scale for many years as service pipes for conveying water; tinned copper pipes and cylinders are very largely used for hot water installations, and in many cases this hot water is laid on to the kitchen and the water is used for domestic purposes. Apparently in some cases plain copper pipes and cylinders are used, in which case the water would be in immediate contact with the metal.

Recently one of these installations was examined, and the water as supplied to the institution was found to contain 0·04 parts of copper per 100,000. The whole plant had been in use for years, and the hot water was used for all purposes without giving rise to any complaints or even to any suspicion of its being unwholesome. The question submitted to me by the architect was, whether I could approve of a similar installation for a much larger institution in the same district using water from the same public supply, which water had a marked effect upon iron and galvanised iron pipes, especially when hot. Before expressing a definite opinion I put myself in communication with people using copper pipes and with the "Copper and Brass Users Association." At their request a series of experiments were also undertaken (the results of which will be referred to later), and finally I expressed the opinion that copper pipes could be used for the institution with perfect safety.

Effect of Ingestion of Minute Quantities of Copper.

Meantime careful research was made for records of the action of copper on the human body, and it was only in out-of-date publications that the opinion was expressed that cases of chronic copper poisoning did occur from the ingestion of minute quantities of copper, and in these cases they never appeared to arise from the use of copper pipes for water or copper vessels for cooking. Until a comparatively recent period, however, there seems to have been a widely held opinion that copper was as poisonous as lead, but this opinion began to be doubted when the causes of food poisoning were investigated. Before this period, if any article of food or drink had caused illness, and had been in contact with copper, no further investigation was deemed necessary. The poisoning was attributed to the copper. Within the last five years a jury returned a verdict of "death from copper and lead poisoning" because the analyst who examined the stomach certified that he found traces of lead and copper therein. The water used in the neighbourhood was said to act on lead, but chronic lead poisoning was unknown, and when the water was, at a little later date, carefully examined it was found to have a barely perceptible action on lead. The symptoms as described by the parents indicated that death was due to food poisoning. The trace of lead found in the system may have been derived from the water; copper is a normal constituent of the body. Cases of this kind get recorded and the erroneous nature of the conclusion may be difficult to prove. In connexion with copper poisoning, if cases of this kind are excluded, there is no evidence of copper in small quantities being a poison or of its being able to produce a condition of chronic poisoning. Of all the authorities consulted two only need be quoted.

Prof. W. E. Dixon, F.R.S., in his "Manual of Pharmacology" (4th edition, p. 412), says:—

"There is no evidence that man is ever affected with chronic copper poisoning, so that the use of copper cooking

vessels and the employment of minute amounts of copper to 'improve' the appearance of peas, may not be so harmful as might be supposed."

Dr. Dixon Mann, in his "Forensic Medicine and Toxicology," 2nd edition, p. 484), refers to the older views about copper poisoning and adds:—

"Formerly toxicologists shared these views and never questioned the existence of chronic copper poisoning; modern authorities, on the other hand, with few exceptions, state that it is unknown . . . . For the present, whilst allowing the possible existence of chronic copper poisoning, it may be accepted that the cumulative action of minute doses of copper is infinitely less injurious to human beings than is the case with similar doses of lead . . . . Copper is almost constantly present in the system and is chiefly eliminated by the bowels."

It is now well known that wheat, barley, and many other articles of food and drink contain copper, hence the presence of traces in the human body.

The Limits of Safety.

Lehman (Archiv Hygiene, xxiv.) calculates that each individual takes into his body daily 20 mg. of copper, and Tschirch, confirming this, adds that so long as the total quantity of copper ingested does not exceed 100 mg. daily there can be no question of injury to health. In works on practical hygiene or water analyses, whilst details for the method of detection are given, an opinion is rarely expressed as to the amount permissible. Wanklyn deals with lead and copper as though their effects were identical, and simply says: "Water should contain less than 1/10 of a grain of lead or copper per gallon." Lehman, in his "Methods of Practical Hygiene," translated by the late Sir William Crookes, appears to regard copper as practically harmless, saying: "The danger of chronic poisoning by . . . or drinking water . . . probably never existed." From a careful consideration of all the evidence available I have arrived at the conclusion that when the average amount of copper in the whole day's supply does not exceed 1/10 gr. per gallon (= 0·14 parts per 100,000) the water can be considered as perfectly wholesome.

Action of Potable Waters on Copper and Tinned Copper.

Having arrived at this conclusion it became necessary to ascertain the action of potable water on copper and tinned copper, and, as these articles may vary considerably, certified specimens were obtained of (*a*) electrolytic copper, (*b*) copper complying with the specification of the British Engineering Standards Association, which contains 99·25 per cent. of the pure metal, and (*c*) the G.P. standard copper, which contains 99·7 per cent. of pure metal. It may be said at once that no appreciable difference in the action upon any of these three could be detected whatever the nature of the water used in the experiment. Two kinds of tinned copper were obtained, one in which the coating contained 99 per cent. of pure tin, and the other in which the coating only contained 50 per cent. of tin. The remainder was obviously lead, and whilst the copper coated with 99 per cent. tin practically withstands the action of all, except acid, waters, the 50 per cent. tin coating yields lead almost as freely as an ordinary lead pipe. Copper coated with 99 per cent. tin may be generally applicable, but the copper coated with 50 per cent. tin is as dangerous as lead, and its use for water service pipes should be strictly forbidden. If the water is one which does not act on lead, then the tinning is unnecessary, and only adds to the cost of the pipes. If the water acts on lead, then there is no advantage in using this so-called tinned pipe and it becomes a great source of danger, since the user, deeming himself safe in using tinned copper pipes, is running all the risks of lead poisoning exactly as though he were using lead pipes. One of the acid waters experimented with took up a dangerous amount of lead from a copper pipe coated with the 99 per cent. tin, but waters of this type are very exceptional.

New copper pipe is a little more freely acted upon for the first few days. This is probably due to the rough surface and a thin coating of oxide. The effect of surface is shown if three copper slips of the same size are put into equal volumes of the same water and allowed to stand for an equal number of hours. A strip which has been exposed to air, used in this condition, yields more copper than a strip which has been cleansed by rubbing with petrol and finest emery, whilst a strip which has been burnished by more vigorous treatment in the same way will yield much less metal to the water than either of the others. If the water is changed daily from the third or fourth day the results obtained are practically identical, showing that the effect of surface has passed away.

The action of water on copper is similar to that of the action on lead, the metal taking up oxygen from solution and an oxide being formed. The solubility of the copper oxide is very much less than that of lead oxide, and the affinity of the copper for oxygen appears to be very much less than that of lead. Possibly about 0·025 part per 100,000 copper or oxide may be in molecular solution, but anything above this seems to be in a colloid condition or in a state of coarse suspension, since filtration through fine filter-paper, asbestos, or porcelain removes nearly all the copper. When any appreciable action is taking place the water becomes dull, but under ordinary circumstances (unlike lead) no visible deposit forms; therefore there does not appear to be any danger from deposits in the pipes.

Cautions in the Use of Copper Pipes.

Under certain conditions, as when an electric current traverses the pipes, action is enormously accelerated and a perceptible pale-blue deposit forms which easily dissolves in very dilute acid and gives a blue colour when an excess of ammonia is added. It is obvious, therefore, that such pipes should not be used for earthing currents. It may be added that in recent years complaints of the action of water on metal pipes have greatly increased in frequency, and there is little doubt that the cause is the use of such pipes, especially by amateur electricians, for this purpose.

When copper pipes are now in use the only complaints which occur are (1) of a green deposit at joints, and (2) the green staining of porcelain enamel by drippings from taps. These effects are due to the accumulation of copper oxycarbonate from the evaporation of the water, and are easily remedied if proper attention is given to the joints and taps. They do not necessarily indicate a dangerous condition of the water.

Experiments with Various Waters.

Experiments have been made with waters derived from large sources of supply from all parts of the kingdom, and waterworks engineers, analysts, and medical officers of health have shown their interest by collecting and sending typical samples.

With water of different types the following results were obtained:—

	Copper.*
River water of moderate temporary hardness—	
London	0·04
Surrey	0·025
Hampshire	0·035
An unfiltered river water	0·06
Deep well waters—	
Chalk	0·000
Limestone	0·05
New Red Sandstone	0·01
An alkaline water—	
Thanet Sand	0·04
Ditto	0·025
Greensand water—	
Hardness 4°	0·01
Moorland water—	
Hardness 4°	0·033 to 0·065
,, 3°	0·01
Moorland water (*cont.*)	
Hardness 1°	0·057 to 0·075
,, 1°	0·15
,, 2·75°	0·15
,, 1° (very acid)	0·65
Acid neutralised with chalk	0·01
Hardness 2·3°	0·05
,, 4°	0·00
,, 0·5°	0·10
,, 4°	0·045
,, 5°	0·06
Spring waters—	
Hardness 21°	0·05
,, 3°	0·075
,, 15°	0·06
Very pure distilled water—	
Hardness 0°	0·14–0·20
+ 4 mg. $MgCl_2$, hardness 4°	0·020
+ 4 mg. NaCl, hardness 0°	0·01

* Copper taken up in 24 hours (parts per 100,000).

The process for estimating the copper which gives the most reliable results is exactly the same as that for estimating the action of water on lead, described in "The Examination of Waters and Water Supplies" [1] (third edition, p. 332), copper foil being substituted for lead foil, and a solution of copper sulphate for the standard lead acetate.

Comparative Solvent Powers of Hot and Cold Water.

Experiments were made with hot water and the results indicate that so long as the water contains oxygen and remains in contact with copper some metal is taken up, for example—

A neutral water—	
Copper taken up by cold water in 24 hours..	0·005 and 0·01
Copper taken up by nearly boiling water in 48 hours	0·033 ,, 0·065
An acid moorland water—	
Copper taken up by cold water in 24 hours..	0·065
Copper taken up by nearly boiling water in 48 hours	1·3
Repeated	1·44

In cold water the amount of copper taken up in three hours is one-third to one-fourth of that taken up in 24 hours. When the action is very slight in 24 hours, the amount of metal taken up in three hours is too small to estimate, though its presence can be detected by the reduced phenolphthalein test, which will show one part of copper in 100 million parts of water.

Whatever the nature of the service pipes used, the water which has stood therein throughout the night should be run off before any is drawn for drinking or beverage-making purposes. It is exceedingly likely that if this precaution were always taken there would be fewer complaints of turbidity, and the risk of any effect upon health would be largely decreased. It is especially necessary where lead pipes are used, and it will be advisable where copper or galvanised iron is utilised.

That very minute quantities of copper in water have an algicidal and bactericidal action is well known, but water standing in copper pipes for 24 hours cannot be depended upon to be free from objectionable bacteria. Very conflicting results have been obtained, yet the above statement seems well established.

Arsenic in Copper.

It is well known that arsenic, in traces, is found in most copper, and experiments were made to ascertain if any was taken up by water. Only one sample of water was found to take up any trace, and it was one which contained a considerable amount of sodium bicarbonate in solution and was therefore distinctly alkaline. This water, when kept in contact with arsenical copper for 11 days, took up 0·003 mg. of arsenic per 100,000. With one day's contact no arsenic could be detected. The small amount of arsenic allowed in the copper used can therefore be considered as without effect. Experiments made with "drawn" copper and "rolled" copper, both arsenical and non-arsenical, did not show that any one kind was preferable to another so far as the action of water thereon was concerned.

Conclusions.

Summarised briefly, the conclusions arrived at are:—1. That copper is far less acted upon by water than is iron or lead. 2. That copper being vastly less deleterious than lead, copper pipes are far safer than lead pipes. 3. That copper pipes can be used for all waters which are not acid in reaction. 4. That acid waters should never be used until the acidity has been removed by treatment. Having been so treated copper service pipes can be used. 5. That practically all waters take up traces of copper if allowed to stand sufficiently long therewith, but that under all ordinary circumstances the amount taken up is far too small to endanger health.

[1] Thresh and Beale. London: J. and A. Churchill. 1925.

PROCEEDINGS OF THE ROYAL COMMISSION ON NATIONAL HEALTH INSURANCE.*

(*Continued from p. 624.*)

EVIDENCE OF THE HEARTS OF OAK SOCIETY.

THE first society to give evidence was the Hearts of Oak Benefit Society, which was represented by Mr. H. Dudley, Chairman of the Executive Council, and Mr. J. P. Lewis, the Secretary.

(Q. 2548–52.) The society has a membership of 433,000 insured persons and is administered under a centralised system with about 380 agents in the principal towns. The agents collect contribution cards and pay benefits; they also do sick visitation where men are concerned. Medical certificates and claims for benefit are dealt with at the head office. The society had a gross surplus of £728,000 at the 1918 valuation and a disposable surplus of £480,000.

The principal evidence of this society embodied recommendations as to the extension of medical benefit to the dependants of insured persons; the abolition of deposit contributors; the limitation of additional cash benefits; the provision of a specialist medical service for insured persons, and the inclusion of dental benefit as a statutory benefit under the Act. Their evidence also covered many recommendations on questions of machinery and minor matters.

Medical Benefit for Dependants.

(Q. 2553–61.) The witnesses suggested that medical benefit should be provided for the dependants of insured persons, broadly on the grounds that such extension is necessary for the improvement of the health of the community as a whole, and that the whole cost, which they estimated at a little more than 3*d.* a week per insured person, should be met by an increase in the weekly contribution, the increase to be borne wholly by the insured person. They estimated the cost at £10,000,000 per annum, and the number of dependants, they surmised, was 20 millions.

(Q. 2562.) Have you made any inquiry at all to ascertain whether the medical profession would be likely to accept the transfer of about 20 million patients from private to contract practice?—No.

Asked whether they considered that the large number of insured persons who had no dependants would accept a flat rate of contribution, and thus bear an equivalent burden with those who had dependants, the witnesses pointed out that unmarried men at present contributed towards maternity benefit, but they agreed (Q. 2622–6) that as this was a matter of ½*d.* a week as compared with a proposed 3*d.* it was not so serious a proposition, particularly in the case of women.

(Q. 2626.) Am I right in saying that single women who are employed are in much more danger of becoming dependent than having dependants?—Yes, that is so.

(Q. 2711–24.) Sir Alfred Watson questioned the witnesses closely as to the finance of their proposal, and they agreed that their estimate both as to the number of dependants and as to the cost per head might be under the mark. They therefore suggested that perhaps doctoring only might be provided and the free supply of drugs left for a later extension.

(Q. 2721.) Then you see no difficulty in providing medical attendance for the wife and children of an insured person and leaving that insured person to provide the

* In previous articles the proceedings of the Commission were reported under the following headings: Introductory Note; The Scope of the Insurance Scheme (see THE LANCET, Jan. 31st, pp. 247–8); The Provision of Medical Benefit (Feb. 7th, pp. 301–3; Feb. 14th, pp. 355–6; Feb. 21st, pp. 403–5); Financial Provisions of the Act (Feb. 28th, pp. 454–7); Medical Certification and the Regional Medical Staff (March 7th, pp. 508–9); The Approved Societies and the Money Benefits (March 14th, pp. 564–5; March 21st, pp. 623–4).

References to the official statement which has been issued as an appendix in four sections are given thus: Section A, para. 69, is shown as "App. A. 69," and references to the oral evidence thus—Q. 1369.

medicine himself, however expensive it may be?—. . . I admit that there is a difficulty; but I submit . . . that the difficulties which you suggest are out of proportion to what would actually take place.

(Q. 2722.) Having regard to the indulgent way in which the medical profession treat the families of the working classes, do you really think that the insured would be substantially better off under your proposal than they are at the present time?—Yes, I do.

As the cost to the State of the proposed extension would appear to be about £3,000,000 per annum, the question was asked whether the Society could show that insured persons generally were not in a position to provide medical treatment for their dependants. (Q. 2725–46.) The witnesses agreed that the present insurance system so relieved the insured persons as to enable them the better to pay for their families, but they thought the case for the extension of the benefit rested on the broad principle that a measure of health would be thereby secured for the insured men and women of the future.

Objections to a State Medical Service.

(Q. 2608, 2750–91.) The Hearts of Oak representatives were opposed to a State medical service. Their chief objections were that there would be (they assumed) no choice of doctor and that the doctors would work by the clock. A State medical service would, they thought, be a soulless service. They agreed that the administration of some of the local medical services—e.g., the tuberculosis centres, child welfare centres, and the school medical services—were good, and also that if a choice of doctor could be secured under a State scheme their objections would largely disappear.

Retention of Insurance Committees.

(Q. 2679, 3661.) The Society recommended the retention of Insurance Committees for the administration of medical benefit and said that they would have no objection to their administering dental or other treatment benefits.

Abolition of Deposit Contributors.

(Q. 2926–3129.) With regard to deposit contributors, who form that group of persons who do not join an Approved Society, the witnesses recommended that societies should be required to take over the whole of these persons, and that such persons should be compelled to become members of societies. The witnesses were examined at great length on this proposal. It was pointed out that deposit contributors were not a fixed number of the same people, but were constantly passing into Approved Societies and being replaced by new deposit contributors (the number of 1914 deposit contributors now remaining is under 50,000). (Q. 2984.) Further, that compulsory allocation amongst Approved Societies would involve the societies being deprived of their rights to expel members, so that the Rechabites might be compelled to retain a drunkard, a Catholic society to retain a Protestant, and a trade union society to keep a man who had gone over to another trade. The witnesses were not, however, disposed to vary their evidence in this respect, nor did they think (Q. 2942) that the allocation of a section of the population among societies which in many cases have social or trade qualifications would be a task of great difficulty.

(Q. 2999.) To abolish the deposit contributor class, and possibly get 100,000 people, at the most, distributed among societies, people who would not otherwise join societies—do you think for that they are going willingly to give up their right of expulsion in respect of all the unsatisfactory characters that might develop among 15,000,000 people?—Yes.

It was also elicited that insured persons, even if compelled to join societies, could not be compelled to accept benefits, and that many contribution cards might get destroyed and thus go to swell the amount of the Unclaimed Stamps Account.

Married Women.

(Q. 3205–3230.) The witnesses thought that married women were not a satisfactory insurance proposition, mainly because of the difficulties of supervising sickness benefit claims.

Pooling of Surpluses.

The witnesses were of opinion that not more than 50 per cent. of a society's disposable surplus should be used for the provision of additional cash benefits, and they thought that societies might be compelled to devote the other 50 per cent. to treatment benefits without being logically obliged at a later stage to accept the loss of their discretion with regard to the administration of the whole of the surplus. (Q. 3240.) They were absolutely opposed to the pooling of surpluses in general, but would not object to some portion being pooled to ensure that all insured persons became entitled to dental benefit.

Dental Benefit.

The witnesses more than once impressed on the Commission the fact that there was a growing demand on the part of insured persons for dental benefit. They thought that at least one-half of the cost of dental treatment should be secured to the insured person and provided as a statutory benefit.

(Q. 3246.) Of all treatment benefits, in our opinion, the one most desired by the insured person, and also the most desirable from the point of view of the country at large, is dental treatment, and that we would take out of the category of additional benefits altogether by making it a statutory benefit. We would not allow it to be administered by the Approved Societies in the way it is at present.

(Q. 3248.) They suggested that the benefit might be administered through the Insurance Committee or through some body representing the dentists, the Approved Societies, and the Ministry of Health together.

(Q. 3648–9.) As there is much more room for individual fancy in regard to dental treatment than with regard to medical treatment, the suggestion was made that the scope of the benefit would have to be closely defined and a proportion only of the insured person's expenditure met.

The Panel Service.

(Q. 3711–55.) The Panel Service in the view of the witnesses is very much better than the service that was given to members of Friendly Societies prior to National Health Insurance, but at the same time it is nothing like what it ought to be; and in a great many instances the doctors do not give the same attention to people who are panel patients as they do to people who are paying them as private patients. They also suggested that in London, at any rate, the practice of referring patients to hospitals was too prevalent. They considered that all capitation fees for persons who had not chosen a doctor might be paid over to the hospitals notwithstanding that the panel doctors as a whole were at risk in respect of such persons. (Q. 3726–9.) If a person delayed choosing a doctor, he might reasonably be required to pay the doctor's fee for the first illness for which he required attention.

Specialist Services.

(Q. 3544–8.) The Society advocated the extension of medical benefit to include specialist services and considered that the cost of these services might be met out of the surpluses of Approved Societies.

(Q. 3547.) We thought that this specialist service, if possible, should be set up, and that it should be a first charge on 50 per cent. of the surplus of societies; and if it could not be paid out of that you might even draw on the other 50 per cent. We are quite prepared for that, and as we are not against some modified form of pooling of surpluses for treatment benefits, my Society, I am sure, would be quite prepared to pool a small part of its surplus to assist those societies that had not a surplus and could not give this service.

(Q. 3450.) Amongst other matters recommended by the Hearts of Oak witnesses were the adoption of the view of the Regional Medical Officer on a question of incapacity for work as definitely overriding that of the panel doctor where there is a

difference of opinion, and the inclusion of medical attention at confinements as part of the general practitioner service under the Act.

EVIDENCE OF THE ANCIENT ORDER OF FORESTERS.

The Ancient Order of Foresters is a registered Friendly Society administering National Insurance through 2430 of its branches (called Courts). It is the fourth largest Approved Society, having 737,577 members at the date of the first valuation and a disposable surplus of £629,800.

Form of Government.

There is direct representation from nearly every Court to a district meeting, held either half-yearly or annually, and direct representation is available from every Court to the High Court of the Order, which constitutes the annual meeting of the Approved Society. The Society claims that a large number of the members participate in the actual administration, and that the form of government accords most nearly with the principles upon which the Act was founded.

(Q. 3796.) A society of the type of the Foresters permits a personal association which is not possible in a large centralised society. The members themselves are enabled by reason of the constitution to take a more direct interest in their own affairs and in the management of their branches. We think, possibly, there is a more humane administration in a system such as we operate than there could be in a completely centralised system.

The Friendly Society Spirit.

(Q. 3183–5.) The Friendly Society or private side of the work still remains undiminished and is, in fact, larger than before the Act.

(Q. 3925.) You will remember that some years ago this matter was looked into, and your witness on that occasion told us that the old fraternal spirit was dying. He looked forward very pessimistically to the old spirit being eliminated with the State coming in, and he foresaw nothing but nationalisation. You would not put that forward to-day? —No; and I doubt very much whether the former witness would in view of events since that period.

Objections to Pooling.

(Q. 4003–4012.) The Society is entirely opposed to any complete scheme of pooling of funds, and is of opinion that such an arrangement would result in lowering the standard of administration and in consequence lead to a greatly increased drain upon National Insurance benefit funds. Any possible saving of expenditure on administration would be greatly outweighed by the increase of benefit expenditure due to lack of incentive to protect the fund. (Q. 4022–5.) They saw no objections to the present system whereby some branches—e.g., in a mining area—having no surplus owing to the heavy calls to which they were subject, were unable to share in the surplus enjoyed by other more favoured branches. This has been accepted on the voluntary side for years.

Medical Benefit.

(Q. 4111–44.) The witnesses did not agree with the statement sometimes made that the service given to the insured population is of a lower quality than that given to private patients of the same class. It may be true in isolated cases, but they had rarely come across cases of dissatisfaction with any real substance in it. They thought that there might be more pooling of medical skill in particular areas and also that there should be greater facilities for more skilled diagnosis.

(Q. 4207.) With regard to the suggestion that doctors were too ready to transfer a troublesome patient to hospital, the reply was that very few concrete instances which could be sifted satisfactorily had come under observation. It was thought that there were more loose views on this particular subject than upon any other.

Medical Benefit to Dependants.

(Q. 4211–2.) This was a tremendous proposition, as to which there was a considerable diversity of opinion among the members. In a general way they would like the benefit extended, but the financial commitments made it difficult to advocate this as a practical proposition.

Travelling Consultants.

It was thought that there was an ample margin in the present contribution to pay for a consultant service. But even if an increase were essential the service would be worth paying for.

(Q. 4113.) The skilled consultant in certain complaints could be, so to speak, put on wheels and instead of being at one centre be taken to various sub-centres on given days according to a time-table.

State Medical Service.

As to this the witnesses did not give expression to any pronounced views, and suggested that until the views of the medical profession on the subject were ascertained they would hesitate to express any opinion.

Dental Benefit.

(Q. 3951, 4119, 4171–7.) In the view of this society dental treatment should be given as a statutory benefit. It should have the effect of conserving the funds of the societies and should be paid for as far as practicable by applying a part of the contributions to a central fund, thus restricting the societies' surpluses. Expenditure incurred by a member, say up to £1, should be met in full, but the service, though valuable, should not be given if it involved increasing the contribution.

(Q. 4172.) In other words, you would, if necessary, curtail the dental service which you think ought to be supplied because of cost?—Yes. Cost is a great consideration. There is a limit beyond which the insured person should not be mulcted for insurance contributions. There is quite a considerable volume of opinion that that limit has already been reached.

KING EDWARD'S HOSPITAL FUND FOR LONDON.

THE annual meeting of the President and General Council of this Fund was held at St. James's Palace on March 17th, when the accounts and report for the year 1924 were adopted. The Prince of Wales occupied the chair.

Lord Revelstoke, the hon. treasurer, in moving the adoption of the account of receipts and expenditure and the balance-sheet, which were subsequently passed, said that it was a source of gratification to the Council that the income for the year 1924 exceeded the estimates submitted to the Council in November last. There was one item in the receipts which would seem to call for special mention—namely, that of "donations," the total of which figured as £22,659. This sum included two anonymous gifts, one of £5000 and one of £7000, without the receipt of which the distribution of £235,000 could not have been provided from the annual income. For the year 1925 the Fund has already received one donation of £5000 from Lady Strathcona.

The General Position in 1924.

Lord Stuart of Wortley, chairman of the Management Committee, moved the adoption of the annual report, which stated that the year 1924 was the first since 1919 in which the voluntary hospitals of London did not receive any assistance from exceptional distributions towards meeting their maintenance expenditure. They had received in 1923 the final instalments of the money collected by the combined appeal which began in 1922. The financial position, leaving out of account all the special distributions, had continued steadily to improve. The net aggregate annual deficit had declined from £381,000 for the year 1920 to £175,000 for the year 1922, and for the year 1923, although there were still 54 hospitals whose income did not meet their expenditure, there

was a net aggregate surplus of £227,000. The last figure took into account an exceptionally large legacy of £247,000; but even apart from this, the net aggregate annual deficit for the year 1923 was reduced from £175,000 to £20,000. In these circumstances the question of the need for hospital extensions, which had been generally postponed since the outbreak of war, began to come to the front.

The total receipts of the King's Fund for the year were £412,472 4*s*. 1*d*., of which £112,240 was from the estate of the late Mr. John Wells; £50,203 1*s*. 9*d*. from the estate of the late Sir Thomas Sutherland; £16,000 from the estate of the late Mr. Samuel Lewis; £19,563 8*s*. 6*d*. from other legacies; £122 15*s*. 5*d*. from gifts to capital; and £214,342 18*s*. 5*d*. from general receipts. The amount contributed by the League of Mercy was £14,500, as in 1923. The total received by the Fund from the League since its foundation in 1899 was now £368,000, apart from the sums awarded by the League to institutions outside the area of the Fund's distribution. During the year the amount spent on administration was £10,614 16*s*. 11*d*., or £2 11*s*. 5*d*. per £100 of the total received, as compared with £8904 17*s*. 6*d*., or £2 1*s*. 4*d*. per £100, in the previous year.

Sir John Bland-Sutton having seconded the resolution, the report was adopted.

Work of the Propaganda Committee.

Sir George Lawson Johnston, chairman of the Revenue Committee, presented the report of the Committee on the work of the Propaganda Sub-committee, and moved the recommendation that it be published in the annual report of the King's Fund for the year 1924. This Committee, the report stated, under the chairmanship of Lord Burnham, was appointed in 1923 as a subcommittee of the Revenue Committee, with a two-fold object—viz., to consider and promote schemes for raising money for the King's Fund in the fields of education, art, science, literature, and law, in general continuance of the work of the Education Auxiliary of the Combined Appeal; and to organise general propaganda of the work of the King's Fund and the voluntary hospitals of London. The Committee had been largely engaged in schemes of direct propaganda not aiming at any immediate financial return; and even in the money-raising schemes the amount and value of the publicity to be obtained had been taken into account quite as much as the profit to be expected. The total receipts from this source were £1864 19*s*. 8*d*.

The adoption of the report was seconded by Lord Burnham and carried.

Report of Management Committee on the Distribution of the Wells' Legacies and Ambulance Cases Disposal.

Lord Stuart of Wortley presented a report of the Committee on the Wells' Legacies Distribution, and the Ambulance Cases Disposal Committee's report, and moved recommendations. He said: 1. In connexion with the special distribution in aid of extensions and improvements, out of the legacies of the late Mr. and Mrs. John Wells, the Council in December last approved grants amounting to £81,000 for schemes which would provide 301 additional beds, of which 53 would be reserved for accident cases. 2. Of these beds, 54 have been opened during the last six months, including 24 for accident cases. 3. Arising out of the Ambulance Cases Disposal Committee's inquiry and report, but without financial assistance from the King's Fund, provision has been made for a further 20 beds for accident cases, making 44 accident beds opened to date. 4. Schemes are also being prepared which will provide yet a further 39 accident beds, making 112 in all. 5. The Management Committee consider that it would be desirable for the special powers of the Distribution Committee in this matter to be continued. 6. Recommendation No. (i.) of the Ambulance Cases Disposal Committee's report, on the subject of the provision of accident beds, is thus being put into operation by the Distribution Committee. Recommendation No. (ii.), on the subject of the lists of voluntary hospitals and Poor-law infirmaries to which ambulance cases should in the first instance be taken, is being carried out by the London County Council, the King's Fund, and the Ministry of Health. The Management Committee were informed in July last that Recommendation No. (iii.), on the subject of the law or procedure applying to Poor-law infirmaries, was under the consideration of the then Minister of Health, and they think it desirable that it should be brought to the notice of the present Minister of Health.

The Management Committee accordingly recommend—1. That, in connexion with the Wells' Legacies distribution, the Distribution Committee should be authorised to entertain further proposals on the lines approved by the Council in July, 1924, with power to act in cases where, for reasons of urgency, it is desirable to take action in advance of the Distribution Meeting of the General Council next December. 2. That a letter be written to the Minister of Health in the name of the Council drawing attention to the correspondence with the former Minister of Health on the subject of Recommendation No. (iii.)[1] of the Ambulance Cases Disposal Committee report, and expressing the hope that action will be taken.

The recommendations, having been seconded by Lady Hudson and supported by Sir William Collins, were carried unanimously.

The Prince's Speech.

H.R.H. the Prince of Wales said that he had already reviewed the events of the past year,[2] but had much to add to that summary. The accounts had come out rather better than the estimates, and that was encouraging for 1925. One thing was certain: the claims on the King's Fund would go on increasing. The first instalment of the Wells' Legacies distribution would help to provide 300 additional beds, and they would all have to be maintained; and there were more extension schemes coming along. Then the enlargement of the Fund's area to 11 miles from St. Paul's had already brought in 14 more applications. So the King's Fund and the hospitals would need increased income; and, if the progress of these last few years was any guide, they would get it, if only the public realised the need. This was where the value of our propaganda work came in. The Special Committee with Lord Burnham as chairman, and Prof. Winifred Cullis as vice-chairman, were making the name of the King Edward's Hospital Fund familiar where it was hardly known before, and, along with that, they were spreading a knowledge of the work of the hospitals which it was hoped would bring in a bigger income for the hospitals as well as for the Fund.

The report of the Ambulance Cases Disposal Committee continued to bear good fruit. Forty-four additional accident beds had been opened; and the Wells' Legacies grants would help to add others. When all the schemes that had already come before the Distribution Committee were carried out, there would be 112 more accident beds in London than there were when the inquiry began.

To a vote of thanks to the Prince of Wales, moved by the Hon. Sir Arthur Stanley and seconded by Sir William Church, His Royal Highness briefly replied.

The Propaganda Committee of King Edward's Hospital Fund for London has arranged a third series of lectures and counter-lectures to be held immediately after Easter in the Great Hall of the London School of Economics, on Tuesdays, at 5.30 P.M.

[1] THE LANCET, 1924, ii., 233.
[2] THE LANCET, 1924, ii., 1357.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.

POST-GRADUATE TEACHING IN LONDON.

A DISCUSSION on post-graduate teaching in London took place at the Royal Society of Medicine on March 18th, under the auspices of the Fellowship of Medicine and Post-Graduate Medical Association. Sir Arbuthnot Lane, President of the Fellowship, was in the chair, and opened the debate by describing the inception and success of the movement. "Post-graduate education," he said, "is a habit which every medical man must acquire if he hopes to succeed in his profession and gain the confidence of the public."

Mr. H. J. Paterson said that the meeting had been called to receive from those present criticism and suggestions. The Association had been founded in 1918 and there were at the present time 40 hospitals associated with it. General course-tickets were obtainable for any period from two weeks to several years, while there were short general courses, refresher courses, and courses in special subjects, while appropriate lectures were delivered in the Royal Society of Medicine from time to time which were open to all members. The aim of the Association was to make London a great centre of post-graduate education for the world, and to encourage the post-graduate habit in British medical men. In America, he said, every self-respecting doctor attended a course at least once a year. Since the inception of the Association £7000 had been distributed by it to the different hospitals. The organisers wanted now to find out what more they could do to meet the needs of post-graduates.

Surgeon-Commander T. Brown Shaw spoke on behalf of the Navy, in which service every medical officer was obliged to pass an examination before promotion to the rank of Surgeon Commander. This requirement involved a five months' course of post-graduate study, three months of medicine and surgery, now taken at the London Hospital, where arrangements were made to meet their particular needs, and two months at the Greenwich Naval Medical School, studying such special subjects as naval hygiene, bacteriology, &c. Courses in tropical medicine were provided at the London School of Tropical Medicine. After 14 years' service it was customary, though not compulsory, for men to take a three months' course in general medical knowledge with special attention to any subject in which they wished to specialise. Seventy-one officers had taken such a course in the three years 1922–24. In this connexion the assistance of the Fellowship of Medicine had been valuable and the facilities provided most satisfactory. The needs of naval men lay chiefly in the realms of neurology, psychological medicine, balneology, dermatology, ophthalmology, and operative surgery. Centralisation would not be of value; it was better to have the work scattered over many hospitals. More clinical work might advantageously replace some of the lectures. The classes were apt to be crowded and further opportunities for operative surgery would be welcomed.

Sir William Leishman described the measures taken for post-graduate study in the Army, which had not yet made use of the Fellowship of Medicine. The Royal Army Medical College provided instruction for young officers and a refresher course for the seniors. A senior course of six months' instruction was compulsory, and the career was punctuated by examinations, on which the future of the officer might depend. The course took place about the tenth year of service—i.e., usually at the close of the first period of foreign service—and on an average 30 captains attended each year. The first part of the course consisted of medicine, surgery, pathology, and State medicine, mostly in lecture form, supplemented by attendance at cattle-markets and recruiting stations. The second part of the course was more clinical and men were able to attend Charing Cross and St. Thomas's Hospitals. Those who showed satisfactory examination results were then given a chance to qualify as specialists in medicine, chiefly tropical, operative surgery, pathology, ophthalmology, ear, nose and throat, obstetrics and gynæcology, dermatology, including venereal diseases, radiology, anæsthetics, mental disease, or hygiene. With some of these subjects the College itself dealt satisfactorily; for others the men went to special centres, such as Bethlem Royal Hospital, and were encouraged to take the higher degrees and diplomas, such as F.R.C.S., D.P.M., and D.P.H. No expense was incurred by the officer in question; the State in this respect was no ungenerous master.

Dr. G. E. Orme spoke as a general practitioner of 25 years' experience who had recently taken up residence in London and associated himself with the Fellowship of Medicine; he found it difficult to speak too highly of the value of the work and the kindness of the administrators. He considered that it had proved itself to be an institution of national importance. If any criticisms were to be made he would refer to two which were commonly heard, though perhaps rather baseless. One was that strangers coming to London were at a loss to know where to go, and when they did arrive at hospitals no one took any notice of them, and they were apt to feel rather out of it. Possibly certain consultants or junior members of staffs would allow their names to be put on a panel and would be personally responsible for arranging tours round hospitals and collecting for demonstration cases suitable as subjects for diagnosis and treatment by every modern means of investigation and therapeusis. Another suggestion he would make was that there should be association between the Fellowship and the provincial post-graduate centres. Some men might wish to take a part of their course in London and a part in some other district of England. Perhaps also there might be some arrangements made for parties to visit important instruction centres abroad, a plan widely adopted in America.

Mr. Zachary Cope urged the institution of some scheme whereby every medical man who needed a refresher course should have some means of obtaining it. Many could not afford either the time or the money; there should be some grant, perhaps from the Government, to form an inducement to every doctor to improve his mind.

Dr. Muriel Lane, speaking as a woman post-graduate, said that what the women chiefly needed was instruction in diseases of women and children and in preventive medicine. Excellent courses of diseases of children had been held, and of particular value were the round-table discussions of differential diagnosis, which might well be extended. The gynæcological courses were too infrequent. There were many difficulties in the way of providing the practical experience needed in obstetrics, gynæcology, and venereal disease, but at least there might be courses of lectures in antenatal and postnatal care, and infant welfare clinics might be added to the list of places to be attended.

Dr. Sophia Jevons spoke as a practitioner living in London who was busy till 5 o'clock every day; she thought that for such as herself the most valuable provision would be a clinical lecture going on some four nights every week to which they could come when able. The London doctor did not want an intensive course to which he had to give up all his time. She was surprised to hear a suggestion of Government subsidy having regard to present taxation.

Dr. H. B. Newham referred to his experience at the London School of Tropical Medicine as post-graduate and teacher of post-graduates. He was sure that the Association was doing its level best, but the teaching itself was the source of the trouble. He was informed that in America no man, however brilliant he might be, had a chance of getting on to

the staff of a teaching hospital unless he could teach. This was not the case in London; many of the best clinicians were quite unable to impart information and would not try to learn the art. The average student loathed lectures, and what was wanted was more experience in practical work. Moreover, there seemed no arrangement for deputising; in his experience the chief was often detained or prevented from coming, and the student who had, perhaps at great inconvenience, attended at the stated time, was left without anybody to take him round. In many clinics there were far too many cases; the person in charge had no time for systematic teaching as he had to get through all the cases somehow. There was a tendency to dwell on rarities; the post-graduate needed instruction on bronchitis far more than on pseudo-hypertrophic pulmonary osteo-arthropathy.

Dr. M. B. Ray asked whether the wealth of material available had been used to the best advantage. There were two classes of post-graduates—the casual, those resident in London doing extra work in their spare time, and visitors from abroad combining instruction with sight-seeing. These were admirably provided for. The second class, small perhaps now but of immense potentialities, consisted of those who wanted to spend some four to six months in real study. It would be a good thing if every doctor were bound to take a refresher course after a certain period in general practice. These at present could return to their old medical school, but this was not satisfactory, and the intensive courses provided were too short. There ought to be a thoroughly up-to-date and well-equipped post-graduate school, with its own teaching staff and attached hospital. Examinations taken at the end of the course should entitle successful candidates to a registrable diploma. He asked whether it were not possible that one of the undergraduate schools might close its doors to all but graduates and form the nucleus of such an institution.

Dr. Fortescue Fox said that the old Society of Balneology had engaged in post-graduate teaching of its subject; when it was amalgamated into the Royal Society of Medicine this activity ceased; he suggested that the present Section of Balneology and Climatology should be allowed to give their serious attention to the teaching of these subjects.

Mr. E. B. Turner referred to the suggestion that practitioners should take part in public health work and said that in this way doctors could combine post-graduate instruction with valuable civic service. Public health work was tending to fall more and more into the hands of whole-time officers, often very recently qualified. General practitioners should work more in municipal clinics, and, where possible, secure election to borough councils and health committees; they could also assist public health by lecturing and teaching, for they would teach themselves at the same time.

The discussion was adjourned to a date provisionally fixed for April 8th.

THE HEALTH OF THE ROYAL AIR FORCE.

THE report on the health of the Royal Air Force for the year 1923 has just been issued.[1] Excluding minor cases of disablement of less than 48 hours' duration, the ratio of fresh cases of admission to hospital per 1000 strength has reached the lowest point so far reported, and the death-rate, the invaliding-rate, the average number of days sickness per individual, and the ratio of the number of sick daily are also the lowest so far recorded. The number of cases of disablement of 48 hours' duration, due to common colds, slight pharyngitis, and nasopharyngitis, show an increase, believed to be caused by the fact that 1923 was the wettest year on record since 1916.

When the separate diseases are analysed an increasing percentage of total invaliding for tuberculosis is revealed: a disquieting feature which is being specially investigated. The case incidence of venereal disease is slightly lower than that for 1922, and this is principally due to a reduction in the readmission-rate suggesting that treatment has become more effective. Upper air-passage infections also show a reduction. Injuries are grouped under the headings of those occurring while on duty and those due to athletics or accidents while off duty and on leave. The injuries due to flying have remained at an almost constant figure of just over 6 per cent. of the total injuries during the last three years, which is considered satisfactory in view of the fact that there has been a progressive increase in the number of hours flown during these three years. The nosological tables have been still further abridged as compared with previous years and require very little explanation in the text.

The Air Force Abroad.

The health of the Air Force abroad is, as usual, made the subject of a separate chapter, and here again the admission-rate, the death-rate, the average number of days sickness per individual, the ratio of the number of sick daily, and invalids from the service are the lowest on record. Sand-fly fever continues to be responsible for a large amount of sickness, especially in Iraq, although a considerable reduction has been effected in the case incidence-rates in each individual area except Malta. The disease appears to vary in intensity from year to year so that it is difficult to estimate how far such a reduction is due to prophylactic measures. Malaria has increased in incidence in most areas: in the case of the Mediterranean Littoral this is explained by an undue proportion of men exposed to infection for the first time, but, on the other hand, in the Basrah district of Iraq, blame is laid on the impossibility of carrying out preventive measures on anything like a large enough scale. In all units a vigorous anti-malaria campaign was prosecuted but without producing the hoped-for results on the case incidence. Dysentery, on the other hand, has continued to decrease, and taken as an index of sanitary efficiency among units stationed in tropical countries, this is very satisfactory.

An interesting feature of the report on the health abroad is an account of the transport by air of 200 cases of diarrhœa and dysentery which occurred amongst a column of British troops operating in Northern Kurdistan. The only available transport consisted of pack animals, so aeroplanes were despatched from Baghdad to deal with the situation and, despite exceptional difficulties and one "crash," fortunately without any untoward result, 198 cases were successfully carried all the way to Baghdad.

Miscellaneous.

A chapter with this heading deals with the work of the Central Medical Board and the results of examination for physical fitness both of recruits and of officers are analysed in instructive tables. Under the heading of hygiene and sanitation the various measures instituted for preserving the health of the Air Force, both at home and abroad, are fully set out. Further tables summarise the laboratory work and the surgical operations carried out at R.A.F. hospitals, together with the dental treatment provided during the year 1923.

[1] H.M. Stationery Office. 1925. Air Publication 1103. 3*s*. 6*d*.

CARDIFF ROYAL INFIRMARY.—This hospital of 310 beds has a waiting list of 1806. The number is swollen by the necessity of taking in street accident cases which are growing rapidly. To meet the difficulty to some extent it has been arranged, with help from the Rockefeller grant to the Welsh National School of Medicine, to buy a house for the accommodation of some of the nurses, whose present dining-room in the hospital is again to become a ward. Patients who do not belong to the contributory fund last year contributed just under £4000.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

The Results of Attempted Rejuvenation.

IN an interesting review covering the whole field and literature pertaining to the problem of sexual rejuvenation by means of surgical interference, Dr. Wilheim has pointed out emphatically that the original enthusiasm over the boon conferred upon mankind by Prof. Steinach and his collaborators has given way to profound silence. Prof. Steinach at first believed that in the genital glands there existed two groups of cells or glands distinct as regarded their function. One was the "gland of puberty," which was supposed to be subject to hypertrophy if the other part, the "progenitory gland," was eliminated by ligation of the vas deferens. Several medical men of ripe age, amongst them Prof. Zeissl (who died recently in Vienna), underwent this operation and published the results obtained. Prof. Romeis is also strongly opposed to the views of Prof. Steinach. Prof. Zeissl published in the *Wiener Klinische Wochenschrift* an autobiographical account of the operation and denied absolutely that it had any of the effects of rejuvenation of his own body, as had been claimed by the "youth restorers." In all the cases of rejuvenation of rats, reported by Steinach, Kammerer, and Voronoff, an improvement of the general condition could be observed after the operation, but the effect was only temporary. After some time the old conditions returned, in some instances even there was distinct deterioration. The return or increase of sexual desire and function could not be proved to be other than a psychic one. Prof. Leschke, of Berlin, was able to demonstrate that the ageing of human beings was dependent not only on the interstitial substance of the testicles, but also on the other inner secretory glands. When it was finally shown by Harms and Romeis that an old male rat could be made to produce long glossy hair, not only by transplantation of testicles, but also of fragments of liver tissue, it became evident that a large proportion of all the "rejuvenation" symptoms were simply caused by reabsorption of non-specific products of metabolism from the transplanted material. Also the use of X rays and of diathermy on the female genital glands, so much in vogue for some time as methods of rejuvenation of the female organism, has become quite obsolete; nor have the original attempts at curing sexual perversion (homosexualism, sadism) by means of transplantation of genital gland tissue been successful. Dr. Lichtenstern reports on 22 cases of such attempts, and is forced to admit that the effect had been rather "overrated." It is therefore questionable whether we are altogether on the right track in trying to obtain a "prolongation of youth" by these means, or whether it is only a faulty technique that is responsible for the unfavourable results.

The Problem of Sleep.

At a recent meeting of the Biological Society of Vienna Prof. Economo discussed the problem of sleep. The outcome of all investigations into this problem is that we do not know yet why we sleep. Neither the theory of changes of the circulation in the brain nor that dealing with toxic substances produced by fatigue is satisfactory. If impressions from the outward world are withheld we may easily fall asleep. But it seems that there is a certain sleep-control centre in the brain which regulates—in a periodic way—sleep and wakefulness. The action of certain hypnotics, as well as somnambulism, shows that sleep is not a negative but a positive function of the brain. In human beings sleep is in close connexion with the change of day and night, but such is not the case in many lower animals. Also the function of the hypophysis seems to pertain to sleep. Experimental pathology has, according to Economo, a vast and fallow field of research to dig on this subject.

Trephining amongst Prehistoric Races and Aboriginal Tribes.

In a very interesting paper read before the Vienna Medical Society Dr. Wölfel discussed the problem of trephined skulls so often found amongst prehistoric and aboriginal peoples It is now accepted, he said, that some races (in America and in Melanesia) still use this method for treatment of certain diseases and conditions, and in both countries, so widely apart from each other, the same method is used for the same conditions; a certain degree of civilisation is required for the knowledge of the procedure; and the peoples practising it have reached the agricultural stage. The method is used for treatment of fracture of the skull; wounds of the temporal bones were, he said, not treated because they were regarded as lethal. The aborigines of the Bismarck Archipelago have a fair knowledge of treatment of such wounds. They perform a regular surgical operation with removal of injured skin, bone, and fragments; they even know how to search between the sulci of the brain for dislocated fragments of bone. They also know how to elevate depressed portions of bone. Also in brain diseases (epileptic fits, headaches, mental disturbances) trephining is practised, and the bone is "eroded" by means of sharp instruments. A bandage consisting of a charred leaf and strapping is then applied. The mortality is low, less than 20 per cent. In some places persons have been found who had this operation performed on their heads five or six times. It is safe to assume, continued Dr. Wölfel, that the prehistoric people, who have left us so many trephined skulls, performed this operation for the same reasons as those on which we now base our surgical operations on the cranium. The prehistoric surgeons also used to make a round, regular, thin-edged opening, no doubt with sharpened flints or bones; Hippocrates tells of this custom amongst ancient and "modern" barbaric races; whilst nowadays in Peru, in Central America, in the Australian and Polynesian islands the custom is still in force, showing that the trend of mental development was in the same direction amongst different races. Dr Wölfel rejected the idea of these operations having been done for religious or superstitious reasons.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Records of the Metropolitan Insurance Company.

SPEAKING in Baltimore on Feb. 9th on the experience of life insurance companies in preventive medicine, Dr. Lee K. Frankel gave interesting records of the years 1911 to 1923 for which accurate statistics are available. During these years the difference between the mortality-rates of the insurance company and of the "registration area" show a saving of 200,000 lives among the policy-holders. This is the more remarkable in that a great deal of this company's work has been amongst workers in industry and their families. Dr. Frankel showed how much greater in 1911 was the risk of death in this group of policy-holders than in the general population. The two death-rates have converged since then, and if the present trends continue, should cross in about two years time. In 1928 it may be safer to be an industrial policy-holder in this company than to be a member of the general public. Dr. Frankel is satisfied that these results are attributable to the health measures inaugurated by his company. Education of the policy-holders both by literature, printed in many languages, and by nurses who also care for the sick, and free medical examinations for those who care to take them were the chief measures employed. Their cost amounted to about one-third of the saving in death claims, which is calculated at 42 million dollars. It is interesting that only 8 per cent. of the policy-holders have availed themselves

of the privilege of regular medical examinations. This group shows a mortality 28 per cent. better than that of the whole group of insured.

Typhoid Epidemic Traced to Oysters.

In a previous letter (THE LANCET, Jan. 21st, p. 252) I mentioned the unusual prevalence of typhoid fever in New York and Chicago and indicated the probability that the investigation undertaken by the Federal Health Service was likely to produce important results. This investigation has already been completed and a preliminary report given by Dr. L. L. Lumsden to the press. It will be some time before the complete report with all the circumstantial evidence can be published, but I am reliably informed that the evidence already obtained is unusually complete, as indeed it must be, to justify the statement that has been made public. The epidemic lasted for two months—from Nov. 15th to Jan. 15th. In this period the actual number of cases of typhoid exceeded the "expected" by 650 in New York, 100 in Chicago, and 50 in Washington. Several other cities have shown an excess number of typhoid cases during the same period. A careful epidemiological record has been made of 98 cases in Chicago and its vicinity, of 42 cases in Washington, and 263 in New York City. The chronology of the outbreaks clearly suggested a common factor in the distribution of the infection in all three cities. The preliminary announcement incriminating oysters is couched in the following terms:—

"The preponderance of evidence is that the general supply of no large distributor of oysters was uniformly infected, but that oysters infected in one or more beds, or part or parts of one or more beds, or at one or more floats, and constituting but a small proportion of the total, were introduced into and distributed with a large supply of oysters of good sanitary quality."

The source of distribution was definitely traced to a company at West Sayville, Long Island, that handles a popular brand of raw oysters. In the interest both of the public health and of the oyster trade it is recommended that provision be made at the earliest possible date for—

"more nearly adequate official sanitary supervision, regulation, and protection of industries engaged in the production, preparation for sale, and distribution in interstate traffic, of shell-fish, vegetables, fruits, milk, milk products, and other foods eaten usually or frequently without being cooked."

Not only the New York oyster industry has suffered but the whole industry of the Eastern shore. The Illinois Commissioner of Health, on what seems to have been very slight evidence, put a ban on the oysters of Maryland, Virginia, and practically ruined the trade in these States. It is now required that before the oysters are readmitted to Illinois careful tests be made to ensure that no typhoid carriers are engaged in the trade.

MEMORIAL TO THE LATE SIR WILLIAM MACEWEN.

A FUND was inaugurated in Glasgow on May 22nd, 1924, with the object (1) of providing a bust of Sir William Macewen for presentation to the University of Glasgow, together with a replica to be presented to Lady Macewen: (2) of endowing a Macewen Memorial Lectureship; and (3) if possible, of instituting a Macewen Medal or Prize in Surgery, to be awarded annually (see THE LANCET, 1924, ii., 32). The General Committee of the Memorial Fund hoped to raise the sum of £3000 and of this figure about £1550 have now been received, the list of subscriptions including names from all parts of the world. The list is still open, and any further subscriptions should be sent to the hon. treasurer, Mr. James Macfarlane, Wesleyan-street, Glasgow, S.E. We commend to our readers this project of raising a fitting memorial to a surgeon whose fame was world-wide, and trust that the full sum aimed at will be obtained, in order that the scheme may suffer no retrenchment through lack of financial support.

The Services.

R.A.M.C. OFFICERS.

ON Monday, March 16th, when the House of Commons went into Committee on the Army Estimates for 1925–26, Lieut.-Colonel Pownall drew attention to the shortage of officers for the Royal Army Medical Corps. Many officers whom the Corps would have been glad to keep on, he said, had resigned in recent years as they were not satisfied with regard to their professional prospects in the Corps and very few had been coming forward. Of 80 vacancies advertised during the past two years only 25 had been filled, and during the year since Jan. 31st, 1924, only one candidate had been gazetted into the R.A.M.C. The total establishment in England and abroad was 884, and the wastage was about 60 or 70 a year. Before the war the pay of medical officers was considerably more than that of combatant officers. Now, while the pay of combatant officers has been greatly increased, officers of the R.A.M.C. receive very little more than in 1914. Once again he reminded the House of Commons that officers in the R.A.M.C. do not get their commissions until they are 24, whereas those in the combatant ranks are gazetted at 19. And once again he suggested that the Secretary of State might consider the question of making the Director-General of Medical Services a member of the Army Council. Lord Esher's Committee some years ago recommended that course, which would give an extra status to the R.A.M.C., and permit the position of the Corps to be represented directly to the authorities. The Secretary of State for War, Sir L. Worthington-Evans, agreed with Colonel Pownall that the position of the R.A.M.C. must be most carefully considered, as the number of medical officers required were not obtained, and consequently a greater burden was being thrown upon those in the Corps than they ought to be asked to support. It was very largely a question of money and conditions of service and in that he was not complete master. The conditions in the Navy and the Air Service had to be considered at the same time, and he hoped that proposals would be brought forward shortly which would enable that position to be remedied.

We share the hope of the Secretary for War, but seem to have heard before promises of remedy to be brought forward shortly. The Services, moreover, are not so much in competition with each other in respect of pay as with lay bodies offering larger pecuniary reward to medical careers that are attended with less sacrifice.

ROYAL ARMY MEDICAL CORPS.

Capt. W. H. Ferguson is granted the temp. rank of Maj. whilst empld. as Dep. Asst. Dir. of Pathology.

Capt. W. H. Dye is restored to the establishment.

TERRITORIAL ARMY.

Maj. A. J. Brown to be Lt.-Col. and to command 155th (Lowland) Field Amb.

Maj. A. E. Evans from Sanitary Companies to be Maj.

Capt. A. E. Chisholm resigns his comn. and retains his rank.

Lts. J. Robinson and H. B. Logan to be Capts.

J. J. Dykes Naismith to be Lt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

G. K. Foster to be Lt.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 14TH, 1925.

Notifications.—The following cases of infectious disease were notified during the week, namely:—Small-pox, 137; scarlet fever, 1508; diphtheria, 883; enteric fever, 42; pneumonia, 1395; puerperal fever, 38; cerebro-spinal fever, 8; acute poliomyelitis, 2; acute polio-encephalitis, 2; encephalitis lethargica, 55; dysentery, 14; ophthalmia neonatorum, 141. There were no cases of cholera, plague, or typhus fever notified during the week. The number of small-pox cases showed a decrease of 198 from the number for the preceding week. Twenty-eight cases were notified from Derbyshire, 20 from Leicestershire (Leicester C.B., 20), 28 from Northamptonshire (Kettering, 26), 14 from Northumberland, 8 from Notts, and 30 from Yorks, North Riding (Middlesbrough C.B., 29).

Deaths.—In the aggregate of great towns, including London, there was 1 death from enteric fever, 100 from measles, 17 from scarlet fever, 104 from whooping-cough, 47 from diphtheria, and 283 from influenza, as compared with 361, 346, 352, and 354 in the four preceding weeks. In London itself the deaths from influenza numbered 36, from whooping-cough 30, and from diphtheria 13.

Correspondence.

"Audi alteram partem."

HEALTH STATISTICS OF THE MERCANTILE MARINE.

To the Editor of THE LANCET.

SIR,—Will you permit me to comment on Dr. E. T. Burke's letter, under this heading, in your last issue? If some of us hesitate about the Board of Trade's conscience—all of us are, unhesitatingly, with Dr. Burke on the side of the sea-farers. Everyone will agree with him that there should be in every port a V.D. treatment centre easily and quickly got at, and at any time on any day, for sea-farers. I submit this centre need not be actually in the docks. That the centre should be for the use, comfort, and aid of the sea-farer exclusively is surely unnecessary. Many years' experience of sea-farers who had sailed to the wilderness of Zin and pitched in Mount Hor convinces me that they are not so exclusive as all that. Moreover, there is that considerable body of men who alternate between shore, dock, and ship jobs; they could hardly be placed in an in-and-out category in relation to treatment at the V.D. centre. The centre should have in-patient accommodation for sea-farers. With very few exceptions the sea-farer on being paid off his ship prefers not to come into hospital for V.D. treatment while his money lasts. When he has no money left he will, sometimes, ask to come into hospital to complete treatment; but more often he signs on a ship again and continues treatment, more irregularly than regularly, from port to port. It is reasonable to believe that with greater facilities for treatment at home and foreign ports this would become less irregular. At foreign ports such facilifies are increasing; many of my patients inform me of the advantage they had taken of them. Actually it must be rare for a crew to be signed on a British ship in a home port unless they have passed the doctor, and my experience is that in the Port of London the examining doctors have keen eyes for indications of V.D. Very many of my patients have failed to pass the doctor; some of them turn out not to have V.D. I believe Dr. Burke overestimates the docility of the sea-farer and the ingenuousness of those in control of ships. The first would not consent to the certification (though their confession to the hospital doctor is frank and ready) about exposure to infection and "prophylaxis." The latter would not sign on anyone, cleansed and injected, or not, about whom there was an agreed and confessed chance of developing V.D. on the voyage. Besides the possible liability for the contagion of others of the crew, there are the passengers' susceptibilities to consider; with any such certification scheme owners could hardly plead their masters' ignorance of the risk of developing V.D. by the certificate-carrying sea-farer, and V.D. is never so hateful as in its early stages and in someone else.

Notices giving information about V.D. treatment centres are posted in ships and in the London Docks; perhaps more might be done in this line. Ship-masters and surgeons are, in fact, informed of these centres. The Port of London draggles on for some fourteen miles of river. Transport between its ports is unspeakably slow and bad. Its V.D. problem is one for several centres. While hospitals in general have, in the past, spurned landsman and sea-farer suffering from non-respectable V.D. (V.D. in the communicable stage), in the Port of London the Seamen's Hospital Society has always succoured and treated the V.D. sea-farer—even taking him into hospital. On any day and at any time the Dreadnought Hospital at Greenwich and the Seamen's Hospital, Royal Albert Dock, have always treated, as in- and out-patients, the V.D. sea-farer of whatever race, nation, colour, or creed; and still do so. Lastly, the second of these hospitals fulfils one of Dr. Burke's requirements in being situated in the docks—ships berth not a hundred yards away.

I am, Sir, yours faithfully,

H. M. HANSCHELL,
Pathologist and M.O. i/c V.D. Clinic, Seamen's Hospital, R.A. Dock.

March 23rd, 1925.

To the Editor of THE LANCET.

SIR,—With reference to the letter from Dr. E. T. Burke that appeared in your issue of March 21st, it is well to point out that in London the care and treatment of sailors suffering from venereal disease is not neglected. Attached to the Seamen's Hospital Society are two venereal clinics, one at the Dreadnought, Greenwich, and the other at the Seamen's Hospital, Albert Dock. At the former there were treated last year 1189 new patients and of this number 80 per cent. were seamen. At the latter 778 were treated, 50 per cent. of these being seamen. At Greenwich no less than 25 per cent. of the sailors were afforded the benefit of in-patient treatment, and at the Albert Dock 15 per cent. were admitted to the wards.

While one realises the great advantage to be derived from placing a centre in every dock, where it is easily accessible to the incoming sailor, this would lead to a multiplication of clinics which would be practically impossible. Of the two clinics mentioned one lies immediately between the Albert and Victoria Docks, while the other is in close proximity to the Surrey Commercial Docks, and the Society is so well known that sailors gravitate to these centres, not only from every dock on the Thames, but from every outport in the Kingdom.

Should the patient be forced by circumstances to go to sea again before his cure is complete he is given a transfer book detailing the treatment he has already received and instructing him where to get further treatment in other ports.

It would be well to remember that this Society is a pioneer in the treatment of venereal disease, which was carried out efficiently before the Venereal Diseases Act was passed.

I am, Sir, yours faithfully,

P. J. MICHELLI.

Seamen's Hospital, Greenwich, S.E., March 24th, 1925.

THE MEDICAL WITNESS.

To the Editor of THE LANCET.

SIR,—In your issue of Nov. 22nd last Sir William Willcox is stated to have said during the discussion on the Medical Witness at the Hunterian Society "the expert witness should be in court during the whole of the proceedings. Indeed, it had been ruled that it was necessary for such a witness to hear the evidence." Will Sir William Willcox kindly give others and myself through your columns the reference to the ruling he quotes? I ask this because in a recent case of criminal abortion where I was called in, when the trial came on all the witnesses were told to retire. I at once asked the magistrate if such instruction applied to the medical witness also, and he promptly replied "Yes." Of course, here in Victoria things may be different, but the general principle should apply. Thanking Sir William Willcox in anticipation,

I am, Sir, yours faithfully,

Melbourne, Victoria, Jan. 27th, 1925. JAMES BOOTH.

*** We have referred Dr. Booth's letter to Sir William Willcox and the following is his reply:—

"Regarding the point raised in Dr. Booth's letter, it has been the usual custom in this country for the expert witness for the Crown to remain in court during the whole of the proceedings. I am referring, of course, to cases in which the evidence of the expert may be required on any point which may arise during the hearing of the case. For example, in toxico-

logical cases it is necessary for the expert witness to hear the evidence relating to the symptoms from which the poisoned person suffered, since he may be required to express the opinion as to whether these symptoms are, or are not, consistent with poisoning by a particular substance.

"During an experience of 20 years it has been my custom, if giving expert evidence in a case, to be present in court during the whole of the proceedings. Indeed, I have often been asked by opposing counsel if I have been present since otherwise my evidence would have been objected to. It must be clearly understood, of course, that individual cases vary and that the presence of an expert witness in court is always subject to the discretion of the Judge. A legal authority has kindly quoted various rulings relating to this subject.

Some Legal Rulings.

"There is not in substantive law, that is, by Statute, any provision regulating the permitted presence or the ordered withdrawal of witnesses on either side from a court during a trial, but the practice appears to be as follows:—

"At any time during the course of a trial and on the application of either party, the Judge may order in his discretion witnesses in the case to leave the court, and it is not a matter of right in either party to obtain such an order. In criminal trials a prosecutor is entitled to remain in court only in his capacity as prosecutor, but if he is a witness also he may be ordered to retire. A solicitor in the case, though a witness, is usually permitted to remain for the purpose of instructing counsel, &c., and it is the usual practice for witnesses who are called to give expert evidence and not to speak to facts only to be allowed to remain even although other witnesses are excluded. If a witness does remain notwithstanding an order, his evidence is not rendered inadmissible, but is the subject of comment.

"As to expert witnesses, the question of whether they may be allowed to remain in court to hear the evidence is now a matter which is decided by the kind of questions which may be put to the expert witness and which assume that he has heard the evidence in the case. It will be recollected that the fifth question in *McNaghton's* case was 'whether the medical man conversant with the disease of insanity who never saw the prisoner previously to the trial, but who was present during the whole trial and the examination of all the witnesses be asked his opinion as to the state of the prisoner's mind at the time of the commission of the alleged crime,' and the answer of H.M. Judges was, 'We think the medical man under the circumstances supposed cannot in strictness be asked his opinion in the terms above stated, because each of those questions involve the determination of the truth of the facts deposed to which it is for the jury to decide, and the questions are not mere questions upon a matter of science in which case such evidence is admissible, but where the facts are admitted or not disputed, and the question becomes substantially one of science only, it may be convenient to allow the question to be put in that general form, although the same cannot be insisted on as a matter of right.'

"In a case of *R.* v. *Wright*, Russell and Ryan 456 (1821), about 20 years before McNaghton, a medical witness was allowed to discuss the facts of the case, the absence of motive, the appearance and behaviour of the prisoner, that he had drink, that he threw a boy into the water, that he did not recollect some of his actions at one time, but recollected them at others—and to express the opinon that the prisoner's mind was disordered. The report does not record whether this gentleman was in court and heard the evidence, but I gather that he was; he could hardly otherwise have obtained all the details which he discussed. The Judges on appeal were somewhat doubtful, but decided that the witness of medical skill might be asked whether such and such appearances or whether such and such actions were symptomatic of insanity. I think this case has been somewhat qualified by the above quotation from McNaghton.

"In *Frances*, 4th Cox 57 (1849), a doctor who had been in court throughout the trial was called and asked whether having heard the whole evidence, he was of opinion that the prisoner was of unsound mind at the time of the offence, and the answer above quoted in McNaghton was discussed, and it was laid down that the proper mode is to ask what are symptoms of insanity, or to take the particular facts in the case and assuming them to be true to ask whether they are symptomatic. The question here sought to be put really substituted the witness for the jury.

"In *R.* v. *Searle*, 1 Moody and Robinson 75 (1831), a physician who had heard the whole evidence was asked to give his opinion as to the insanity of the prisoner. The Judge doubted whether this could be done, but on referring to *R.* v. *Wright* above quoted, he allowed him to be asked whether the facts and appearances proved showed symptoms of insanity.

"In 2 Russell on Crimes, eighth edition, p. 2142, a note by a great authority, the late Mr. C. S. Greaves, reads as follows:—'It is now the ordinary course to permit not only attorneys, but professional or scientific persons to remain in court, the rule being considered as not applying to witnesses of those descriptions.'

"In a comparatively recent case of *R.* v. *Mason*, 76 Justice of the Peace, 184 (1911), Mr. Pepper, who had not seen the body or the wound, but had heard the evidence given by the doctor who had seen the body, after reading the depositions, was asked, and allowed to answer after objection, his opinion as to whether the wound was self-inflicted or not, and *Frances'* case above quoted was cited in the Court of Criminal Appeal. Lord Alverstone said 'the point raised is of importance' and approved of the admission of Mr. Pepper's evidence as being the opinion of an expert witness on *assumed* facts.

"In Archbold, 26th edition, 451, it is stated that 'symptoms being proved, a physician may be called upon to give in evidence his opinion as to the disease of which the party died, although he had never seen the deceased. So upon an indictment for murder the deceased's wounds being described, a surgeon may be called upon to give in evidence his opinion whether the deceased died in consequence thereof, or from natural causes, or whether the wounds were self-inflicted.'

"In view of all these authorities, it seems to me that the propriety which is now established of asking a medical man or other expert his opinion, assuming the facts given in evidence are within his knowledge, involves the proposition that he may remain in court and listen to the evidence, because it is not merely upon such facts, for instance, as are disclosed in the depositions, but all facts elicited in examination or cross-examination which tend to form material on which his opinion is based, and this cannot be satisfactorily dealt with unless the expert hears the evidence. There may well be matters to which neither side attach importance, which the expert on hearing them, may deem of great importance. Consequently, I think that, always subject to the discretion of the Judge but recollecting the established practice, a medical man or other expert should remain in court, and the value of his assistance in a technical matter to the jury and the Court would be much depreciated if he were excluded therefrom."

ARTIFICIAL SUNLIGHT IN INFANTILE PARALYSIS.

To the Editor of THE LANCET.

SIR,—May I mention in your columns the result of recent researches into the treatment of infantile paralysis in which I have used general radiation of the body by artificial sunlight, and local treatment of the affected muscles by red rays?

The observations which led to my using general radiation by artificial sunlight were as follows. In 1920 I began the study of artificial sunlight treatment at St. Thomas's Hospital. I chose as one of my groups of cases children suffering from rickets. This work I did in coöperation with Dr. R. C. Jewesbury. We found that about a month's treatment with artificial sunlight was enough to secure a virtually normal X ray picture of bones which had shown at the beginning of treatment a marked deficiency in calcification. I found at the beginning of their treatment these children were fretful. They did not like to be touched; they cried at the least thing; did not like having their clothes put on; slept badly; did not put on weight and, in short, appeared to me to be suffering from symptoms of acute neurasthenia. These symptoms were the first to clear up under the light treatment. They were rapidly transformed into happy, contented and easily managed children. This change was the first to appear; it came even more quickly than the bony recovery, and it appeared to me that the change was due to the rapid improvement of nutrition in the nerve centres under the action of light. I followed up the broad hint furnished by this observation by treating a series of children suffering from infantile paralysis at the Heritage Craft Schools, Chailey, with artificial radiation obtained from a mercury-vapour lamp used in conjunction with a group of lamps consisting of carbon filament in vacuo with a suitable reflector.

With regard to local treatment of the muscle by red rays, at Leysin Dr. Augustus Rollier showed me the wonderful improvement in muscular development that took place under the sun's rays, and he told me he thought this must be due to the action of the red or infra-red rays. The infra-red rays are absorbed and diffused by water, consequently the water in the tissues prevents the heat rays from penetrating them deeply. The red, on the other hand, are not interrupted by water, and it is easy to see how they penetrate the tissues by merely holding the hand in the path of a sunbeam entering a shady room when the red rays can be seen to penetrate the fingers easily. In order to secure the intense radiation of the paralysed limbs with red rays, I passed the rays from the carbon-filament lamps through red screens, so screening off much of the heat without cutting down the red rays. I could thus use a red light of much greater intensity than is possible without the red screen. This treatment was used in addition to the ordinary electrical treatment.

The results obtained were far in advance of anything I have seen in the course of a long experience in the treatment of such cases. They show a recovery of faradic and voluntary response in muscles that were so much atrophied as to give no electrical response at the beginning of the treatment, and in some cases the initial attack had taken place many years before the treatment began. I am submitting a detailed communication.—I am, Sir, yours faithfully,

G. MURRAY LEVICK.

Harley-street, W., March 16th, 1925.

STOVARSOL IN THE TREATMENT OF SYPHILIS.

To the Editor of THE LANCET.

SIR,—In your issue of March 7th reference is made to acetyloxyaminophenylarsinic acid, known as "190," or stovarsol, and to the protection it affords against syphilis when taken by the mouth soon after exposure to infection. Experiments have amply demonstrated that stovarsol will prevent development of primary lesions if administered by the mouth sufficiently early; it has also considerable value in the treatment of the disease when manifested. It is an active remedy in yaws, and is being used with great success in the treatment of amœbiasis. The product is supplied in tablets, and we shall be happy to furnish full information to any member of the medical profession.—We, are, Sir, yours faithfully,

MAY AND BAKER, LTD.

Battersea, London, S.W., March 20th, 1925.

VESALIUS, RONDELET, AND RABELAIS.

To the Editor of THE LANCET.

SIR,—In THE LANCET of Feb. 28th, p. 447, there is a leading article upon a lecture by Prof. R. Cruchet. Therein it is stated that Vesalius studied for several years at Montpellier where he had as his master Rondelet. There is no authority given for this statement, which is at variance with generally accepted facts. After taking an Arts course in Louvain, Vesalius went to Paris to study medicine. He was then 18 or 19 years old and he remained at Paris for three years (1533–36). It is known that he spent some months thereafter in Louvain, Brussels, and Venice. He ultimately reached Padua, where his name first appears in the University records against the date Saturday, Dec. 1st, 1537. In Italy he remained teaching till 1543, when his famous De Humani Corporis Fabrica was published. There is no indication that he ever visited Montpellier at any time. Rondelet he may have known since both were numbered amongst the students of Gunterius of Andernach in 1535. Vesalius, however, nowhere mentions his name. In any event Vesalius could not have been his pupil since Rondelet did not become Professor in Montpellier till 1545.

There is just as little ground for placing Rabelais among the students of Rondelet. The creator of Pantagruel received the degree of Bachelor at Montpellier on Nov. 1st, 1530, he then being 47 years old. Rondelet had been studying in Paris for some years, but returned to his native town—Montpellier—in 1529 and forthwith received his licence. Armed with this he immediately started the practice of medicine in a small town of Provence. His attempt was, however, a failure and after turning to the teaching of grammar for a livelihood he again returned to Paris to improve his knowledge of medicine. It was then he became a pupil of Gunterius. Rondelet has been very commonly identified—probably upon the similarity of name—with Rondibilis, but it is scarcely necessary to add that the identification is purely conjectural.

I am, Sir, yours faithfully,

Edinburgh, March 16th, 1925. G. MATHESON CULLEN.

THE INFECTIVE FILTRABLE VIRUSES.

To the Editor of THE LANCET.

SIR,—The annotation headed as above in THE LANCET of March 21st gives information on what at the present time is the most important of all questions in biology and pathology. Though the most subtly-conceived and delicate experimentation and the most careful observation must be applied to the discovery of some details, a practical understanding of the kind of organisms that have filtrable stages is unlikely to be acquired if commonplace facts and obvious results of the simplest experiments are generally ignored.

The constant association of many specific filtrable viruses with specific cell-inclusions, as seen, for example, in mosaic disease of plants, molluscum contagiosum, variola, &c., is too often forgotten. In molluscum the cell-inclusions, called molluscum corpuscles, have been known for 70 years at least, and the presence of a filtrable virus in molluscum is well established. Placed in water in the simple way that I have described[1] the corpuscles constantly show activities, which prove them to be protists related to synchytrians. Their nature thus revealed, their histological relations prove them to be the cause of the disease. The filtered virus has also been proved to be the cause of the disease; therefore the molluscum corpuscle and the filtrable virus are but different phases of the same protist.

Any conclusions that may be reached in ignorance of the above-mentioned facts concerning molluscum should be very closely scrutinised.

I am, Sir, yours faithfully,

London, March 21st, 1925. J. JACKSON CLARKE.

THE GOULSTONIAN LECTURES.

To the Editor of THE LANCET.

SIR,—Through an error of mine in transcription Reference 50 in the first of my Goulstonian Lectures in THE LANCET last week reads as follows:—"Boldyreff, W.: *Quart. Jour. Exp. Path.*, 1914, viii., 1." It should, of course, have been "*Quart. Jour. Exp. Phys.*, 1914, viii., 1."

In seeking to do justice to the more recent work on human gastric function I am afraid it may also appear that I have paid too little attention to the experiments of this distinguished physiologist. Prof. Boldyreff was the first to show on animals that gastric acidity is regulated by duodenal reflux and to point out that so-called hyperacidity must generally be due to defective neutralisation. Apparently he regarded positive forces in the duodenum (and not the behaviour of the pylorus, as my text might seem to suggest) as the important factor controlling alkaline regurgitation. I am, Sir, yours faithfully,

Wimpole-street, W., March 21st, 1925. J. A. RYLE.

[1] Protists and Disease, 1922.

TREATMENT OF SEPTICÆMIA.

AT a combined meeting of the Sections of Surgery, Medicine, and Pathology of the Royal Society of Medicine held on March 24th, with Dr. Robert Hutchison (President of the Section of Medicine) in the chair, Sir Thomas Horder opened a discussion on the treatment of septicæmia. He said that his views on this subject differed little from those he held ten years ago. The nature of the infecting organism naturally bore on the treatment, and the two common cocci involved were the *Streptococcus pyogenes vel hæmolyticus* and the *Staphylococcus aureus*. He classed the methods of treatment into three main groups: (1) General or non-specific measures, (2) bacteriotherapy, (3) chemo-therapy.

General or Non-specific Measures.—This group comprises: (*a*) Rest, both of the individual and of the region of the primary focus, if this was ascertainable. (*b*) Fresh air, to the extent permitted by the patient. (*c*) Sunlight. (*d*) Diet, which should be free, fluid at the height of the infection but containing many calories. (*e*) Reassurance, including the general attitude towards the patient and his complaint. (*f*) Hydrotherapy, about which there was considerable difference of opinion. In America this was more extensively used than in this country. (*g*) Elimination, with attention to bowels, skin, and kidneys. (*h*) Sleep. (*i*) Anodynes, among which he recommended opium, suggesting that we were too loth to use this drug nowadays. (*j*) Treatment at the site of infection, drainage, elevation, which gave much relief, heat, in the form of continuous baths or fomentations, and antiseptics. He was opposed to the use of very strong antiseptics which might interfere with the vitality of the tissues. (*k*) Intravenous infusion in acute cases. (*l*) Transfusion of whole blood, of which he had not had much experience. (*m*) Drugs, which were useful, but must not be relied on alone. He put first arsenic, preferably in the form of sodium cacodylate, one grain in one c.cm. of a saturated solution of nucleic acid or sodium nucleinate, given twice daily intramuscularly throughout the whole course of the disease. The smell of the breath showed when the patient was saturated with it. After that came opium and then such other drugs as quinine, strychnine, digitalis, and the hypnotics.

Bacteriotherapy.—This took the form of immune sera, bacteriological antigens, or combined methods. Sir Thomas Horder was accustomed to give an initial dose of not less than 50 c.cm. of univalent antistreptococcal serum intravenously on the first day, repeating it on the second, perhaps on the third day. By that time an autogenous vaccine could usually be prepared, the sensitised type being the most advantageous form, given in doses of 100 million the first time, 250 million on the third day, and 500 million on the fifth or sixth day. In "immunogen" an attempt had been made to get certain products of auto-digestion of the micro-organism as well as the endotoxin, and this substance was worth trying.

Chemotherapy.—This took the form of chlorine or coal-tar derivatives, metals, or colloidal metals. These had proved disappointing. In the staphylococcal form of the disease the infection was more pyæmic, giving more time, but having the disadvantage that no serum could be prepared. The treatment of chronic septicæmic processes such as ulcerative endocarditis was as disappointing to-day as ten years ago; the best line to take was that of using all possible non-specific methods, especially sunlight.

Prophylaxis.

Mr. R. P. Rowlands regarded prophylaxis as extremely important. It could be accomplished by taking every precaution against infection during operations, by prompt excision of contaminated wounds, prompt removal of local sources of systemic infection such as acute appendices, perforated ulcers, acute infective osteomyelitis of long bones and anthrax lesions, by the careful opening of boils and carbuncles, and by the universal use of rubber gloves at operations and autopsies. When the disease was once established the physician, bacteriologist, hæmologist, and surgeon should collaborate and should seek constantly to find, remove, or treat the source of infection, which might be occult, such as dental abscesses, tonsillar or gall-bladder infections, pus hidden deep in the buttock, loin, liver, calf muscles, or pelvis. Whole blood transfusion seemed more helpful than immuno-transfusion, being quicker; it combated the anæmia and raised the immunity. Sunshine, feeding-up, and careful nursing were valuable accessories.

Functional Activity of Leucocytes.

Dr. L. Colebrook spoke of the work done by himself and his colleagues at St. Mary's Hospital in the attempt to find out where it was that the mechanism of defence broke down in these cases. The answer seemed to be that there was a diminution in the functional activity of the leucocytes, which might be increased in actual numbers, but had their function reduced to one-half or one-tenth of the normal. This phenomenon was met with in all infections, even the common cold, but was at its maximum in streptococcal septicæmia. This might not be the whole story but was a very large factor, and its computation gave a better idea of prognosis than any other method, with the possible exception of an actual microbic count. The treatment suggested by these results was to neutralise the toxins and kill off as large a number of microbes as possible. The process of active immunisation was not hopeful; the leucocytes were so injured that no response could be obtained from them by a vaccine. The body seemed to make little or no response to septicæmic infection. Passive immunisation by antisera seemed rather hopeless also. There was but slender evidence to show that any antiserum destroyed the bacteria or neutralised toxins, and sometimes the patient was made worse and in any case was liable to serum-sickness and discomfort. The use of immuno-transfusion seemed to be in borderline cases, where it was doubtful whether there were actually micro-organisms in the blood. It was customary to give the donor 1000 million staphylococci and wait three or four hours before transferring the serum. On the whole, the results were disappointing; in grave cases the patient was not saved. A better method of immunising donors was still being sought; the process was valuable but should not be relied on alone to save cases. In chemotherapy the conditions demanded of a drug were: (1) That it should not further diminish the activity of the patients' leucocytes or destroy other essential tissues; and (2) that the patient's blood should be shown to be bactericidal to the infecting microbe after its administration and to remain so for a sufficient period; or (3) that the blood after administration should be capable of neutralising the toxin that was destroying the leucocytes. None of the drugs mentioned fulfilled these conditions, but in the neosalvarsan group was a collection of substances which were satisfactory in this respect. In all cases there was an increase of a few thousands for some hours; the drugs seemed nearly specific to the *Streptococcus hæmolyticus*.

Sir Almroth Wright expressed the opinion that the clinical line of approach to medical problems should be replaced by a more scientific attitude. He had classified it as the "saltus empiricus"; clinicians saw only the remote results and paid no attention to immediate results. Nothing would ever come out of clinical observation. Immuno-transfusion was not to be classed as a failure; it was only a limited method.

Mr. Zachary Cope said that all the pathology of the blood and tissues was not yet known; a great deal of the problem of immunity was still a shibboleth of "We believe, we think, we hope and we trust." There was as yet no answer to the question as to why

certain microbes selected certain tissues for their activity and were relatively harmless in others. He asked what was the function of the cellular tissue in the body in resisting septicæmia and what was the function of the epithelium in withstanding bacteria on its surface. In his opinion the clinician must continue to use his judgment and do what he could until more accurate knowledge of the selective activity of the tissues of the body was obtainable.

Dr. Hutchison spoke of the relief he had obtained from the immersion of a septic finger in a bath and the free use of port as a general means of maintaining strength.

Mr. Herbert Tilley recorded a personal experience of septicæmia, due to a prick through a glove. In an early stage he had obtained remarkable temporary relief from an injection of serum. In later stages the greatest relief had been given by free incision, immersion of the limb in hot baths, elevation and the administration of chloral and bromides as hypnotics. Morphia made him feel ill all next day. In the matter of scientific medicine, he pointed out that practice sometimes preceded scientific explanations; soldiers knew better than to bivouac in mosquito-haunted swamps years before the cause of malaria was worked out, and the shepherd on the hills had found, in his meal of bread, cheese, salt, an onion, and a bottle of beer, the perfect diet since acclaimed by physiologists.

Obituary.

MARY DARBY STURGE, M.D. LOND.,

PHYSICIAN TO THE BIRMINGHAM AND MIDLAND HOSPITAL FOR WOMEN.

WITH the recent death of Dr. Mary Sturge, a pioneer among women doctors in Birmingham, there passes one whose life was a record not only of devoted work in the service of medicine, but of continual and selfless striving in the wider field of social life for the betterment of humanity.

Miss Sturge was born in 1862 in Edgbaston, of Quaker parentage, her father being Wilson Sturge, former Mayor of Birmingham, who was a staunch adherent to the principles of the Society of Friends. She received her early general education at Edgbaston High School for Girls, and at the age of 18 she entered, with a few other women students, the Mason Science College of Birmingham University which had just opened. Six years later, in 1886, she passed the preliminary scientific examination of the London University, and entered the London School of Medicine for Women, her application to study at the medical school of Birmingham having been refused. In London Miss Sturge had a distinguished student career; she took honours in anatomy in the intermediate M.B. examination and honours in medicine in the final M.B., while she was awarded the Prideaux Scholarship for an original paper on clinical obstetrics. Her first appointment after graduation was as resident at the Clapham Maternity Hospital, and at the same time she acted as physician to the Dispensary for Women and Children. Between 1892 and 1895 she held successively the posts of resident at the North-Eastern Fever Hospital and as senior resident at the New (now Elizabeth Garrett Anderson) Hospital for Women. Having gained the M.D. Lond. in 1895, she took up general practice in Edgbaston, where the rest of her life was spent. From 1895 to 1905 she was attached to the Birmingham and Midland Hospital for Women as anæsthetist, and from 1905 till her resignation in 1924 she held the position of honorary physician on the hospital staff. Outside the work of her practice she was active in many things pertaining to medicine and to the general welfare of her fellows. In 1894 she delivered the inaugural address at the opening of the session at the London School of Medicine for Women, and during the years 1920 to 1922 she was the first provincial president of the Women's Medical Federation, an organisation which she had helped materially to build and in which she took the keenest interest. Her work in the cause of temperance, of which she was ever an enthusiastic advocate, was crowned by the publication in 1907 of "Alcohol and the Human Body," written with the collaboration of the late Sir Victor Horsley. Her great care for the well-being of children was further revealed in her constant insistence on the importance of sunlight and fresh air for healthy growth—at a time when neither of these were generally accepted as essentials for happiness. One of her recent enterprises was the founding of the Birmingham Taylor Memorial Home for Inoperable Cancer.

Miss Sturge was a fine physician and a great woman, with the soul and spirit of a pioneer, which won the respect of her colleagues and the love of her patients.

THE BATEMAN APPEAL.

As already explained in THE LANCET, it has been felt that material assistance ought to be offered to Dr. Bateman to meet the legal expenses of his recent successful appeal against conviction and to make good the deficiency in his professional income. Accordingly, the Bateman Fund has been opened and lists of contributions have appeared in recent issues. We have received additional contributions as follows:—

	£	s.	d.
Already received and acknowledged ..	379	3	0
Dr. G. H. Adam	5	5	0
Dr. A. L. Vaughan	5	0	0
Dr. Arthur J. McNair	3	3	0
Dr. F. C. Poynder	2	2	0
Dr. J. Stewart	2	2	0
Dr. W. H. Coupland	1	1	0
Dr. Hugh Lawson	1	1	0
Dr. H. W. Newton	1	1	0
Dr. T. J. T. Wilmot	1	1	0
Dr. F. C. Bottomley	1	0	0

Remittances should be forwarded to the Manager of THE LANCET, 423, Strand, W.C.2, and made payable to the "Bateman Fund Account."

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates passed in the subjects indicated:—

Surgery.—W. Bentley, Birmingham; N. E. Challenger, McGill; A. J. M. Davies and A. Kaplan, St. Mary's Hosp.; Y. N. Lal, Dundee; T. K. Natesan, London Hosp.; and F. T. Ridley, Birmingham.

Medicine.—A. H. Allam (Sect. II.), St. Mary's Hosp.; T. K. Natesan, London Hosp.; and F. T. Ridley, Birmingham.

Forensic Medicine.—E. H. Boodrie, St. Mary's Hosp.; M. R. Burke, St. George's Hosp.; B. Horwitz and T. McD. Kellough, Guy's Hosp.; A. Mishriky and C. M. Moody, St. Mary's Hosp.; C. C. Po, Guy's Hosp.; F. T. Ridley, Birmingham; and B. L. Steele, Univ. Coll. Hosp.

Midwifery.—I. H. Mackay, Sydney; K. V. Mead, St. Thomas's Hosp.; E. J. Newman, London Hosp.; F. T. Ridley, Birmingham; and R. J. Rutherford, Durham.

The Diploma of the Society was granted to the following candidates entitling them to practise medicine, surgery, and midwifery: A. H. Allam, W. Bentley, N. E. Challenger, A. J. M. Davies, Y. N. Lal, A. Mishriky, T. K. Natesan, C. C. Po, and F. T. Ridley.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At a meeting of the Council of the College held on March 12th licences to practise dentistry were conferred upon 82 candidates. The following are the names and schools of the successful candidates:—

P. Adelson, Royal Dental; H. R. Allen, Guy's; S. G. Allen, London; W. J. Badenhorst and W. P. Beresford, Guy's; R. F. Beveridge and H. C. Beyers, Royal Dental; A. Caldwell, Manchester; F. H. Chapple, Guy's; H. I. Clapperton, H. Clausen, and W. D. E. Clayton, Royal Dental; O. E. Clements, Univ. Coll.; E. J. Clother, Guy's; A. M. Cohen, M. Cohn, and E. D. Collins, Royal Dental; L. Cowlishaw, Guy's; A. T. Craig, Univ. Coll.; J. S. Crapper, Guy's;

F. T. Cullen, Royal Dental; Marie J. V. R. de Plamas, London; D. S. Dixon and W. G. Duncombe, Royal Dental; J. W. Finnemore, G. W. Gathergood, H. A. Gillett, G. E. Glazebrook, G. M. Glennie, N. Goldthorpe, and E. C. Grant, Guy's; S. Grantham-Hill, London; W. E. Herbert, Guy's; J. Hovsha, Royal Dental; H. Howard, Manchester; S. R. Howcroft and D. A. James, Guy's; T. P. Kapadia and C. H. Kennard, Royal Dental; J. C. Laight, Univ. Coll.; H. C. Lawrence, Guy's; C. H. McGivern, Royal Dental; H. C. L. Maister, Guy's; F. G. Mallett, Royal Dental; W. R. Mason, Birmingham; Adeline M. Matland, Royal Dental; G. Meadows, Bristol; V. H. L. Meyers, Royal Dental, A. D. Miller, Guy's; G. Miron, Univ. Coll.; C. I. T. Morgan; Bristol; L. A. Moules, S. N. Muir, and J. H. Mynhardt, Royal Dental; J. G. Nelson, Guy's; Olive Nicholls and S. H. Oomrigar, Royal Dental; R. H. N. Osmond, London; Winifred N. Pilcher, D. D. Pochin, and J. J. Reader, Royal Dental; E. B. Rees, Guy's; W. E. Revill and A. L. Robison, London; L. F. O. Seymour, Guy's; F. W. Sievers and C. H. Soutter, Royal Dental; L. A. Steel, Guy's; Ella M. Storey, Univ. Coll.; Amelia Tobias and H. J. Toerien, Royal Dental; F. H. B. Tofts and S. Thomson, Guy's; V. A. Vasey, Manchester; de W. Vorster, Guy's; W. G. Webster, Birmingham; J. F. Wege, Guy's; T. H. Wignall, Liverpool; E. C. Wilkerson, London; G. S. Williams, Univ. Coll.; and W. R. Williams, London.

Diplomas of M.R.C.S. were conferred upon the following, who have passed the requisite examinations and have now complied with the by-laws.

Victor Alexander Edge, Madras and London Hosp.; and Gladys Evelyn McCabe, Royal Free and St. Mary's Hosps.

UNIVERSITY OF LONDON.—A Keddey Fletcher-Warr studentship of the value of £200 a year for three years has been awarded to Douglas Creese Harrison, B.Sc. (King's College), for research in biochemistry.

UNIVERSITY OF MANCHESTER.—At recent examinations the following candidates were sucessful:—

DIPLOMA IN PUBLIC HEALTH.

Part II.—Hilda Pratt.
Part I.—E. R. Gilmore, Bridget Lineham, and A. C. Newman.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.

Part I.—W. G. Thomson.

DIPLOMA IN VETERINARY STATE MEDICINE.

Parts I. and II.—R. C. Locke and Reginald Lovell.

UNIVERSITY OF LIVERPOOL.—Honorary degrees will be conferred at a special congregation on June 5th on, amongst others, the following distinguished members of the medical profession:—LL.D.: Sir Dyce Duckworth, Sir Robert Jones, and Sir Henry Hadow (Vice-Chancellor of the University of Sheffield); D.Sc.: Principal Sir J. C. Irvine (Vice-Chancellor of the University of St. Andrews).

ROYAL NAVY MEDICAL CLUB.—The annual dinner will take place this year at the Trocadero Restaurant, Piccadilly Circus, W. 1, on Thursday, April 16th, at 7.30 for 8 P.M. Members who wish to be present are asked to inform the Hon. Secretary, Royal Navy Medical Club, 68, Victoria-street, London, S.W. 1, not later than seven clear days before that date.

BALNEOLOGICAL CONGRESS.—The Fortieth Congress of Balneology organised by the Balneologische Gesellschaft, Berlin, will be held from April 3rd to 8th in Karlsbad, Marienbad, and Franzensbad. Prof. Dietrich will preside. Full information may be obtained from the General Secretary, Dr. Hirsch, 16, Franzhofer-strasse, Charlottenburg, near Berlin, Germany.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—It is proposed to resume the discussion on Post-Graduate Study in London at the house of the Royal Society of Medicine on Wednesday, April 8th, at 6 P.M. Sir Arbuthnot Lane will again preside, and it is hoped that many members of the medical profession will attend and give their views.—Other lectures are announced in the Medical Diary.—During April three special courses will be held, each of two weeks' duration; an intensive course in Medicine, Surgery, and the specialties at the Hampstead General Hospital; during both weeks there will be a daily morning and afternoon session, including clinical demonstrations, ward clinics, and out-patient work.—A course in Diseases of Children at the Queen's Hospital, Hackney-road, E.; work will be carried on in the wards, out-patient and special departments.—The other course is on Proctology at St. Mark's Hospital for Diseases of the Rectum, at which will be given clinical lectures with operations and demonstrations of the methods pertaining to rectal diseases. Copies of the syllabus of the foregoing courses may be obtained on application to the Secretary to the Fellowship of Medicine at 1, Wimpole-street, London, W. 1. The following special courses will take place in May: Dermatology, Diseases of Infants, Nose, Throat, and Ear, and Psychological Medicine.

CREMATION SOCIETY OF ENGLAND.—The annual meeting of subscribers will be held in the Adam Hall, at 12, Stratford-place, London, W. 1, on Wednesday, April 8th, at 3 P.M.

AUGUSTUS AND ALICE WALLER MEMORIAL.—£2000 have been subscribed for the memorial to Dr. and Mrs. Waller. The money has been invested by the Council of the Royal Free Hospital School of Medicine for Women, London, and the interest will be used for scientific research at that school. For a Waller research room at St. Mary's Hospital so far £105 have been subscribed.

ROYAL DENTAL HOSPITAL.—The annual general meeting of governors of this institution was held on March 19th at the hospital, Leicester-square, London, W.C., when the Chairman, Sir Fisher Dilke, presided over a large body of supporters, and made a wise speech. It was trying, he said, to an audience to be supposed to be interested in such deep truths as that the number of patients who were treated for plastic fillings was 17 odd thousands, or that a dozen hæmoglobin tests were safely applied, and he proposed to refer his hearers for such information to the annual report. But he enlarged a little on the double task of the hospital in providing treatment for the teeth of the poor of London, and of educating its patients, and London generally, until they realised the vital need of healthy teeth as companions to a healthy body and mind; and he called particular attention to the opening of the greatly enlarged children's department and X ray room. For some time those responsible for the management of the hospital, he said, had felt that the children should be attended in a department of their own where special care could be given to them—this had been accomplished by a reorganisation of departments and to a certain extent by re-building. A considerable sum of money had been spent on this work, and he acknowledged a most generous contribution of over £600 through the action of Sir Oswald Stoll in placing the Alhambra Theatre at the disposal of the hospital for a concert. The X ray department had also been greatly enlarged, as it was becoming more and more indispensable as a means of diagnosing obscure dental troubles, from which so many of the patients suffered. "But the hospital has," he said, "outstanding a large amount of the mortgage on our building, and banker's orders paying even the most modest sums into our account annually are what we daily pray for, while welcoming the magnificent gift which all hospital committees dream of." He closed by asking the meeting to voice their sincere thanks for the help and encouragement received from the honorary staff.

MENTAL AFTER-CARE ASSOCIATION.—The annual meeting of this Association was held at the Clothworkers' Hall, London, on March 18th, Sir Charles Wakefield, the President, presiding. The speakers included Sir Frederick Willis, chairman of the Board of Control, Dr. H. Wolseley-Lewis, medical superintendent of Maidstone Mental Hospital, and Mr. Lionel Faudel Phillips, hon. treasurer of Bridewell and Bethlem Royal Hospitals, and various members of the Council. There was a large attendance and much interest was evinced in the proceedings. Dr. Rayner, chairman of the Association, in moving the adoption of the report, referred to the very large increase in the number of cases dealt with in the previous year and the greater public support that was needed in order to enable the Association to meet the ever-growing demands on its resources. He announced with great pleasure among other donations the gift of £500 from Sir Charles Wakefield. Sir Maurice Craig, treasurer of the Association, drew attention to the fact that the expenditure last year exceeded the receipts by some £1100, and also to the fact that one-third of the total receipts last year were contributions from patients and their friends, in itself a wonderful tribute to the way in which the work is appreciated by those for whom it is intended. Other speakers were unanimous in their approval of the way in which the work was carried out. Sir Frederick Willis said that he sincerely hoped in time some means would be devised whereby the Association could be lightened of some of its financial worries while increasing the scope of its work to extend all over the country. Dr. Wolseley-Lewis pointed out that the extension of the work with regard to the arrangements for visiting the homes of patients before discharge and reporting to the medical superintendents, and keeping in touch after discharge was to his mind an enormous help to the medical superintendents and visiting committees, and enabled many patients to be discharged more quickly. He urged that more help should be raised in the hospitals by musical services, offertories, and collecting boxes. The meeting closed with a vote of thanks to Sir Charles Wakefield for presiding and for his generous gift, and to the Clothworkers for their hospitality in entertaining the large number present. Other donations included gifts of £10 from the Clothworkers' Company, from Mr. L. H. Bolton, and Mr. L. G. Foster.

ON the promotion of Sir A. Symonds, K.C.B., Second Secretary, to be Secretary to the Board of Education, the Minister of Health has approved the appointment of Mr. E. R. Forber, C.B., C.B.E., to be Deputy Secretary to the Ministry, and Mr. L. G. Brock, C.B., and Mr. I. G. Gibbon, C.B.E., to be Principal Assistant Secretaries.

A NEW KENSINGTON HOSPITAL.—The Kensington, Fulham, and Chelsea General Hospital is the only institution of its kind amid a population of half a million, and its 19 beds are obviously inadequate. It has, therefore, been decided to rebuild it from designs by Sir Aston Webb, on a 112-bed basis, at a cost of £100,000. The scheme has the financial support of King Edward's Fund.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.—A course in parasitology will be held at the Tropical Division of the school from April 27th to June 25th. The fee for the course is £2 2s. Lectures will be given on entomology by Colonel A. Alcock, on helminthology by Prof. R. T. Leiper, and on protozoology by Dr. J. G. Thomson. The course is primarily intended for students taking the first part of the D.P.H., but there may be room for other students. Further information may be obtained from the Secretary of the School, at the temporary offices, Institute of Historical Research, Malet-street, London, W.C. 1.

MANCHESTER ROYAL INFIRMARY. — The post-graduate lectures and demonstrations on medical, surgical, and special subjects, given by the honorary staff, were resumed on March 3rd, and will be held each week (with the exception of Tuesday, April 14th) till May 26th. On Fridays clinical cases will be shown in the wards. These demonstrations will be continued (with the exceptions of April 10th and 17th) till Friday, May 22nd. All the lectures and demonstrations will commence at 4.15 P.M. There will be no fee.

LIVERPOOL: NEW OPERATING DEPARTMENT AT MILL ROAD INFIRMARY.— On Tuesday, March 24th, in the presence of a large assembly, a new operating department at Mill Road Infirmary was opened by Mr. John Ellis, chairman of the infirmary. The site chosen is on the ground floor in the north-east courtyard between two ward-blocks. The scheme suggested by Dr. R. T. Bailey, medical superintendent, and Mr. O. Herbert Williams, visiting surgeon, has been very ably planned by Mr. E. B. Bailey, M.S.A., F.S.I., the architect, and carried out under his direction. There are two entrance halls. From the one, which leads from the surgical wards, access is had to a dressing sterilisation room with an adjoining store-room, a robing room for the surgeon and asistants, with a shower-bath and lavatory. Off the other hall is a robing room for nurses. These halls lead to a large octagonal court, lit by a dome in which are doors leading into a cystoscopy room, a laryngological operating-room, two anæsthetic rooms, two operating theatres, with an instrument sterilisation room between them. Each theatre is 25 ft. long by 16 ft. wide, and is lit by a north light. The guardians of the West Derby Union are to be congratulated on building this splendidly equipped operating department, which will be of great benefit to the sick of Liverpool. Messrs. Brown and Backhouse, of Liverpool, were the contractors for the work. On the same day the new X ray department and electro-therapeutic department were opened.

CHELSEA CLINICAL SOCIETY.—The fifth meeting of the present session of this society was held at St. George's Hospital on March 17th, Dr. Gordon Lane, the President, in the chair. Dr. Leonard Williams read an entertaining address on the diseases of old age. Constipation and errors in diet, in the way chiefly of excess, were, he said, in great part responsible for senile troubles. The dentist was the aide-de-camp of the cook, and dealing with the control exercised over the body functions by the ductless glands the adrenal was considered to be at fault in many cases of disease in the old man and woman. Mr. Kenneth Walker thought that in some cases ligature of the vas deferens was a useful operation, but in his opinion grafting in the testicle did a great deal of good. Mr. Ivor Back confirmed this view from the experience of about 30 per cent. of his cases, though in a great many the operation of putting a graft in the testicle had not fulfilled expectations. Mr. Back gave an interesting account of testicular grafting which he had performed in a valuable boar, the result being that the boar which had shown no desire for female society reversed his proclivities but apparently had no procreative power. Mr. Ralph Thompson gave some of his experiences of dissections of the ductless glands. The general opinion of the speakers was that when a graft was put into some organ, the result was certainly not immediately shown.

The next meeting will be held at St. George's Hospital on April 14th, when cases and specimens of clinical and pathological interest will be exhibited.

Parliamentary Intelligence.

HOUSE OF LORDS.

TUESDAY, MARCH 17TH.

Therapeutic Substances Bill.

THE House went into Committee on the Therapeutic Substances Bill.

The Marquess of SALISBURY (Lord Privy Seal) stated that the Government had considered the point raised by Viscount Haldane on the Second Reading in regard to permission being given to men of science to obtain therapeutic substances for use in research work without a licence. It was proposed to issue special licences to individuals or institutions enabling them to import at will parcels of these substances for research purposes. The information that A. B., being a scientific man of eminence, or C. D., being a scientific institution, had received such licences would be conveyed to the Customs authorities and would be quite sufficient to obtain the necessary permission to import.

The amendment was agreed to.

THURSDAY, MARCH 19TH.

The Therapeutic Substances Bill was read a third time and passed.

HOUSE OF COMMONS.

WEDNESDAY, MARCH 18TH.

Naval Ratings Discharged Medically Unfit.

Mr. HORE-BELISHA asked the First Lord of the Admiralty whether he was prepared to consider the suggestion that all ratings discharged from the Royal Navy medically unfit for further service, for reasons beyond their own control, be given a pension at the basic rate in respect of the length of their service, particularly in view of the fact that their careers had been ruined and that their wage-earning capacity had been depreciated.—Mr. DAVIDSON (Parliamentary Secretary to the Admiralty) replied: As the present scales and conditions of pension for disability were determined after very careful consideration, I regret that I am unable to adopt the hon. and gallant Member's suggestion.

Invalided Naval Ratings.

Mr. GIBBINS asked the First Lord of the Admiralty the number of lower ratings who were invalided from the naval forces during the year 1924–25; and the amount of compensation paid in these cases.—Mr. DAVIDSON replied: Approximately 1200 men were invalided from the Royal Navy during the period from April 1st, 1924, to Feb. 28th, 1925. Of these 294 qualified for pensions at an average rate of £37 per annum, 850 qualified for gratuities only, at the average rate of £10. The remainder had less than a year's service and were ineligible for the grant of compensation.

Isolation Hospital in Parts of Lindsey.

Captain CROOKSHANK asked the Minister of Health whether the cost of erecting an isolation hospital for the treatment of infectious diseases in the Parts of Lindsey, as proposed, would have to be recovered by means of a special county levy over the whole area served by such a hospital, and that the cost of maintenance and treatment of patients would have to be recovered in the same way; and whether he proposed to introduce legislation this session with a view to removing this hardship which arose under the existing Public Health Acts.—Mr. NEVILLE CHAMBERLAIN replied: The answer to the first part of the question is in the affirmative. As regards the second part, I am anxious to introduce legislation for the amendment of the Public Health Acts in this and other respects as soon as opportunity offers, but I cannot at present say whether this will be possible during the present session.

Health Conditions on British Ships.

Sir ROBERT HUTCHISON asked the Secretary of State for Foreign Affairs whether the British Government recognised the right of American consuls in the United Kingdom to withhold from British vessels clean bills of health on grounds other than those of the sanitary or health conditions of British ports or of the vessels or her crew; and whether an American consul was justified under any treaty or agreement with the United States of America in refusing to issue a bill of health from Glasgow to Manila on the ground that he disapproved of the nature of part of a cargo which was not illegal in either Britain or the Philippines.—Sir BURTON CHADWICK (Parliamentary Secretary to the Board of Trade) replied: There is no treaty or agreement between this country and the United States regulating the issue of bills of

health by the officers of the one country in ports of the other, and the issue of bills of health is governed by instructions given by the respective Governments. Neither Government is called upon to recognise the instructions given by the other.

National Health Insurance Payments.

Mr. SMEDLEY CROOKE asked the Minister of Health the amount spent each year since the passing of the National Health Insurance Act on medical service (doctors, medical supplies, medicine, &c.) and maternity benefit, respectively. —Mr. NEVILLE CHAMBERLAIN replied: The following statement gives the approximate amount spent in England and Wales in each year since the passing of the National Insurance Act, 1911, to the end of the year 1923 on the respective services specified in the question.

Year.	Payments of medical benefit.			Payments of maternity benefit.
	Medical service (doctors).*	Medical supplies (medicines, &c.).	Total.	
	£	£	£	£
1913	2,860,000	736,000	3,596,000	1,077,000
1914	4,140,000	1,051,000	5,191,000	1,206,000
1915	3,388,000	866,000	4,254,000	1,120,000
1916	3,699,000	956,000	4,655,000	1,079,000
1917	3,520,000	940,000	4,460,000	919,000
1918	4,115,000	1,041,000	5,156,000	882,000
1919	4,927,000	1,092,000	6,019,000	1,042,000
1920	7,413,000	1,543,000	8,956,000	1,695,000
1921	7,926,000	1,468,000	9,394,000	1,747,000
1922	6,961,000	1,488,000	8,449,000	1,606,000
1923	6,681,000	1,509,000	8,190,000	1,526,000

* Including payments to doctors in respect of the domiciliary treatment of persons suffering from tuberculosis.

Mr. SMEDLEY CROOKE asked the Minister of Health the number of sick and accident cases relieved each year since the passing of the National Health Insurance Act; the number of women relieved each year; the number of men relieved each year; the total number of weeks of relief; and the total number of insured persons each year.—Mr. NEVILLE CHAMBERLAIN replied: In the year 1923 there were approximately 13,317,900 insured persons in England and Wales, of whom 8,992,100 were men and 4,325,800 were women; and in that year the total payments of sickness and disablement benefits amounted to a sum of £11,533,400, of which £7,677,500 was paid to men and £3,855,900 was paid to women. A table giving for England the total number of insured persons, the receipts and expenditure on benefits for each of the last ten years is given on pp. 166 and 167 of the Fifth Annual Report of the Ministry of Health, Cmd. 2218 (1924). It is not possible to give the number of cases assisted in a year or the total number of weeks of sickness as no occasion has arisen for requiring approved societies to keep such statistics, and the necessary data are, therefore, not available.

Dismissal of Plymouth Medical Officer.

Mr. HORE-BELISHA asked the Minister of Health whether his department had received from the Plymouth Town Council a report of the proceedings culminating in the dismissal of Dr. Bushnell; whether he had approved this dismissal; and, if so, whether he would give the doctor an opportunity of having the charges against him specified in order that he might refute them.—Sir KINGSLEY WOOD replied: The answer to the first part of the question is in the negative. As regards the second part, my right hon. friend's approval is not required to the determination by the Town Council of their contract with Dr. Bushnell, and the last part of the question, therefore, does not arise.

THURSDAY, MARCH 19TH.

Appeals against Final Pension Awards.

Lieut.-Colonel ACLAND-TROYTE asked the Minister of Pensions whether he would consider the possibility of allowing men who were granted a final award for a disability assessed as under 20 per cent. to appeal within 12 months of the termination of the pension award instead of within 12 months of the grant of the award; and whether he would make this right retrospective in all cases of disability below 20 per cent. in which appeals had not already been lodged. —Lieut.-Colonel G. F. STANLEY (Parliamentary Secretary to the Ministry of Pensions) replied: Having regard to the provisions of Section 4 of the War Pension Act, 1921, the suggestion made in this question could not be carried out without legislation. In any event, however, my right hon. friend could not, in fairness to the general body of officers and men to whom final awards have been made, give an extended period of appeal to one class alone. My right hon. friend would point out that the right of appeal is freely exercised in the class of case referred to, since, up to the present date, appeal has been made by slightly more than one out of every four cases in which a final award of this class has been notified.

Sick Benefit Regulations.

Mr. REID asked the Minister of Health whether, in the forthcoming comprehensive insurance scheme, he would consider the desirability of including a provision whereby those persons who, under the present regulations, were not entitled to claim any sick benefit, after a period of residence abroad exceeding one year, until the intervening contributions had been made up, or a further 104 contributions paid, might have imputed to them the benefit of those contributions made to the time of their leaving this country. —Mr. NEVILLE CHAMBERLAIN replied: Under the existing health insurance scheme an insured person who goes abroad for more than a year is treated, on his resuming employment in this country, in the same way as any other person entering insurance, and accordingly becomes entitled to sickness benefit, at a reduced rate after payment of 26 and full sickness benefit after payment of 104 weekly contributions following his return. I see great difficulties in the way of the adoption of the hon. Member's suggestion, but I am sending it to the Royal Commission on National Health Insurance for their consideration.

Industrial Smoke and Public Health.

Mr. ROBERT YOUNG asked the Minister of Health whether he was aware that about 70 per cent. of air pollution was the result of smoke from industrial chimneys; whether his department had taken any steps to investigate the problem of smoke prevention by the use of smoke-filtering apparatus and with what result; and whether he would inquire what had been done by way of experiment by the corporations of our larger cities.—Captain REID asked the Minister of Health whether, in view of the fact that 66 per cent. of the air pollution was due to smoke from industrial chimneys and that such air pollution was known to be injurious to health, any legislation was contemplated which would make the use of smoke-filters in factories compulsory.—Mr. NEVILLE CHAMBERLAIN replied: For the country generally, the proportions of industrial smoke stated by the right hon. Members appear to be much too high. I hope to introduce a Bill on the subject next session. I have no special information about smoke-filters, but if the hon. Members have any device in mind, I shall be pleased to receive particulars from them.

Housing Schemes under 1923 and 1924 Acts.

Captain T. J. O'CONNOR asked the Minister of Health the number of public authorities who, during the 12 months ended Feb. 28th, 1925, adopted the 1923 Housing Act and the 1924 Housing Act, respectively; and the number of houses for which permission had been given by the Minister to public authorities under each Act during this period.—Mr. NEVILLE CHAMBERLAIN replied: On Feb. 25th, 1925, the total number of authorities who had received approval to housing schemes under the Housing Act, 1923, was 1411 and these schemes provided for 184,202 houses. Proposals covering 73,056 houses were approved under the Act of 1923 in the year ended Feb. 25th, 1925, and 334 local authorities first adopted schemes under the Act in that period. Approval was given within the same period under the Housing (Financial Provisions) Act, 1924, to schemes of 311 local authorities covering 31,900 houses.

FRIDAY, MARCH 20TH.

Public Health Bill.

Mr. WOMERSLEY, in moving the Second Reading of the Public Health Bill, said he had served for a long time on a local authority and he knew the benefit that would be derived by local councils if this measure became law. The primary object of the Bill was to collect into one Act and make available for the whole country provisions which Parliament had already inserted in a great number of local Acts which had been privately promoted. It consolidated and brought up to date all the Acts connected with the public health. The Bill dealt with questions of principle which had already been decided by the House, and if there were any amendments to it he suggested they might be dealt with on the Committee stage. The measure was supported by municipal authorities throughout the country and had been wanted for a considerable time.

Mr. TAYLOR seconded.

Lieut.-Colonel FREMANTLE said he was glad to support the Bill from the point of view of his special experience as a county medical officer of health. It was largely a jumble of measures which had proved useful in one or other of the localities where they had been tried. There were two or three points which would have to be considered in Committee. Clause 59 defined "a dangerous infectious disease"

as a disease named in Section (6) of the Act of 1889. Unfortunately a great many unpleasant and dangerous diseases had been discovered since 1889. Under Subsection (2) of Clause 59 the Minister of Health might by Order declare any other infectious disease to be a dangerous infectious disease for one particular area or generally or temporarily or permanently, and this would apply to diseases not named in the Act of 1889, as, for example, cerebro-spinal meningitis; it would also include tuberculosis and other diseases—in fact, anything which the Minister thought necessary. That allowed a very large amount of latitude and adaptability in the application of the Act. Since the great Act was passed by Disraeli in 1875 there had been a constant succession of Public Health Acts, and it was almost impossible for anyone who had not made a professional study of public health law and administration to know his way through the different charters of the last 50 years. He hoped that they would have a promise from the Government of a consolidating Public Health Bill within the next year or two, and that the House would agree to give this Bill a second reading unanimously.

Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) said that so far as his Department was concerned they welcomed this Bill and would be glad to see it secure a second reading. Naturally they would desire to examine the measure again in Committee, but subject to that the Government would be glad to afford it what facilities might ultimately be found necessary so that it might speedily reach the statute book. The Government were very anxious to bring forward a consolidating Bill. But they could not do so at present and this Bill was a necessary preliminary to any consolidating Bill. Directly this measure was passed the Government proposed to introduce another measure amending the Public Health Acts which experience had shown to be necessary. A Bill for this purpose was well advanced and would have been introduced this session, but the Association of Municipal Corporations was anxious that the Bill which the House was discussing that afternoon should be promoted as soon as possible. Two separate Public Health Bills could not be dealt with in the same session, and the Government therefore decided to defer the introduction of their Bill until the session of 1926.

The Bill was read a second time unanimously.

MONDAY, MARCH 23RD.

Indian Medical Service.

Major-General Sir RICHARD LUCE asked the Under Secretary of State for India the present strength of officers in the Indian Medical Service; how many of these were of European birth; and how many recruits, European and Indian, respectively, had been obtained for permanent service during the past 12 months and how many for short service.—Earl WINTERTON replied: The figures at the present time, as nearly as I can ascertain them, are: permanent officers 532 British, 142 Indians; temporary officers 148 Indians. In the last 12 months 14 British officers have been appointed to permanent commissions with the option of retiring with gratuities after five years' service. I am not aware how many Indians have been appointed in India to temporary commissions during that period. A number of Indians not exceeding ten have recently been or are about to be appointed to permanent commissions.

Local Authorities and Slum Properties.

Viscountess ASTOR asked the Minister of Health in how many cases objections to notices served by local authorities upon the owners of insanitary property, with a view to houses being put into order, had been raised on appeal to his Department; and how many of these appeals had been rejected.—Sir KINGSLEY WOOD replied: During the year ended Dec. 31st, 1923 (the last year for which figures are available), notices requiring repairs, &c., under the Housing Acts were served in respect of 25,277 houses. During this year 37 appeals were received by the Department, 5 appeals were formally dismissed, 3 allowed, and 4 allowed in part. The remainder were not proceeded with.

Test of New Remedy for Foot-and-Mouth Disease.

Sir JAMES REMNANT asked the Minister of Agriculture where it was proposed to build the isolated experimental station at which the official test of Dr. John Shaw's remedy for and prevention of foot-and-mouth disease was to be made; if the building had been started; from whom the doses with which the test was to be made were being obtained; and whether he had decided that Dr. John Shaw should be present and carry out the test when it was made.—Mr. WOOD replied: It is not proposed to build a new experimental station for the purpose of testing Dr. Shaw's remedy. The premises at Pirbright formerly used by the Ministry as a cattle-testing station, which are being adapted for use by the scientific committee on foot-and-mouth disease, will be utilised for the purpose. No doses of the remedy have yet been obtained, but I presume that Dr. Shaw will be prepared to supply them when required. It is not legally possible for Dr. Shaw personally to carry out the tests without a licence granted by the Home Secretary under the Cruelty to Animals Act, 1876, which I am advised he does not hold, but I propose to invite him to concur in the suggested scheme of experiments, and to be present during their conduct by the responsible officers of the Ministry's Veterinary Staff.

TUESDAY, MARCH 24TH.

R.A.M.C. Officers' Pensions.

Maj.-Gen. Sir RICHARD LUCE asked the Secretary of State for War if he was aware that an officer in the Royal Army Medical Corps had recently retired, after 20 years' service, with a pension of £328 per annum, and that this sum was £37 below the sum he understood he would receive, after 20 years' service, when he joined the corps; and if he would take steps to secure that no officer who joined the corps before the Warrant of 1919 came into force would in future be retired on a lower pension than he would have received under conditions existing when he joined the corps.—Sir L. WORTHINGTON-EVANS replied: The fact referred to by the hon. and gallant Member is due to the joint effect, on this individual case, of the rule that service on the West Coast counts double towards the 20 years required for voluntary retirement and of the introduction in 1919 of a rank element into the calculation of retired pay. I am, however, looking further into the position.

Sir RICHARD LUCE also asked the Secretary of State for War whether he was aware that a major, Royal Army Medical Corps, retiring after 20 years' service, only received an increase by the 1919 Warrant of £31 to his previous pension of £365 and that, by the reduction of 5½ per cent. on the increased pension of £396, he had had the increase reduced not by 27½ per cent. but by nearly 67 per cent.; and if he would take steps to secure that these officers did not in future have their pensions reduced by a larger amount than 27½ per cent. of the increase granted in 1919.—Sir L. WORTHINGTON-EVANS replied: My hon. and gallant friend's question is, I think, based on a misapprehension. The revision due to the fall in the cost of living, which was made from July 1st last, applied to the 1919 rate of retired pay itself and not to the difference between the rates under the 1914 and 1919 Warrants. A reduction of 5½ per cent. was therefore applied correctly to the 1919 Warrant rate of £396 per annum in the instance quoted.

Physical Defects in Army Recruits.

Mr. GILLETT asked the Secretary of State for War what number of the 49,245 men who were rejected last year as recruits to the Army were refused on the ground of defective eyesight and what number on account of defective teeth.—Sir L. WORTHINGTON-EVANS replied: The information required is only available in the case of the 20,742 men who were rejected by medical officers on primary medical examination and after attestation. Of these, 1743 were rejected for defective vision and 2062 for defective teeth.

WORTHING HOSPITAL.—The governors of Worthing Hospital, at the annual meeting on Feb. 27th, gave consent to plans for the rebuilding of the administrative department, provision for the accommodation of the domestic staff, and the reorganisation of the heating and hot-water systems, the total sum involved being £8000. Authority was given the committee to pay such balance out of capital as might be necessary to carry out the work. Mr. H. R. P. Wyatt, J.P., the President, announced the gift of £500 from a generous friend towards the building fund, and the same generous friend had promised another like sum if the residents would do their share.

THE LATE DR. FRÉDÉRIC MORIN.—Dr. Frédéric Morin, President of the Station Climatérique de Leysin, died recently at Leysin, Switzerland, in his seventy-third year. Dr. Morin was born at Yverdon, and studied medicine in Lausanne and Berne, qualifying in 1877. He practised first at Colombier on the Lake of Neuchatel. In 1890 he became, with Dr. Louis Secretan, the chief promoter of the Société de la Station Climatérique de Leysin, a body founded with the object of creating at Leysin a resort for the cure of tuberculosis. Later he became medical adviser of the Sanatorium des Enfants and of the Sanatorium Populaire at Leysin. Further, he was one of the founders of the International Union against Tuberculosis, of which he was later elected President. At several meetings of this Union he contributed valuable papers on the sun treatment of tuberculous diseases. Dr. Morin presided over the congress of the Union, which was held at Lausanne last year.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY, Burlington House, Piccadilly, W.
THURSDAY, April 2nd.—4.30 P.M. *Papers to be read:* Prof. H. E. Armstrong: Studies on Enzyme Action, XXIII. The Oxidase Effect and the Phenomena of Oxidation in General. Carbonic Oxide. N. K. Adam and G. Jessop: An Explanation of the so-called Intertraction Phenomenon between Solutions and the Molecular Significance of Negative Surface Tension. (Communicated by Sir William Hardy, Sec. R.S.)—*Papers to be read in title only:* Jane Sands, M.D.: Investigation of Oxidation in the Blood of Earthworms. (Communicated by J. Barcroft.) R. Snow: Conduction of Excitation in the Leaf of Mimosa Spegazzinii. (Communicated by Dr. A. H. Church.) Dorothy Adams: Investigations on the Crystalline Lens. (Communicated by the Glassworkers' Cataract Committee.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Tuesday, March 31st.

MEETING OF THE SOCIETY: at 5.30 P.M.
Special Discussion on
Endocrine Therapy.
Opening Speakers:
Dr. W. Langdon Brown, Prof. Swale Vincent, Mr. Leslie Pugh, Dr. H. Gardiner-Hill, Mr. Kenneth Walker.
Other Speakers:
Dr. Leonard Williams, Dr. H. Crichton Miller, Mr. J. E. R. McDonagh, Dr. M. B. Ray, &c.
(The Meeting, if necessary, can be adjourned at 7 P.M., and resumed at 8.30 P.M.)

Wednesday, April 1st.

SURGERY: at 8.30 P.M.
Paper: (illustrated by diagrams, microscope slides, and cinema films) on
Some Results of the Experimental Anastomosis of Certain Nerves with Neighbouring Nerves, by Sir Charles Ballance, Mr. Lionel Colledge, and Mr. Lionel Bailey.

LARYNGOLOGY, MEDICINE, NEUROLOGY } Members of these Sections are specially invited to attend this meeting.

Friday, April 3rd.

LARYNGOLOGY: at 4.30 P.M. (No cases will be shown.)
Discussion on
Paroxysmal Rhinorrhœa.
To be opened by
Dr. J. Freeman and Dr. A. Brown Kelly; followed by Dr. James Adam.
Paper:
Dr. Margaret C. Tod: The Results of Operations on the Nose and Throat in Cases of Asthma.

OBSTETRICS AND GYNÆCOLOGY:
No Meeting of the Section will be held in April.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, March 30th.—9 P.M., Sir Bernard Spilsbury: Wounds and other Injuries in their Medico-Legal Aspect. Last Lettsomian Lecture.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.
FRIDAY, April 3rd.—8.45 P.M. (at the Miller General Hospital, Greenwich, S.E.), Mr. E. Stanley Rowbotham: Anæsthetics for Operations in the Region of the Mouth and Nose.

MANCHESTER MEDICAL SOCIETY.
WEDNESDAY, April 1st.—4.30 P.M., Discussion on Encephalitis Lethargica. To be opened by Dr. Donald E. Core, Mr. W. St. Clair McClure, Dr. B. J. Ryrie, and Mr. J. Henry Dible.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.
TUESDAY, March 31st.—5 P.M., Dr. Hector Cameron: On Some Forms of Vomiting in Infancy. (Second Lumleian Lecture.)
THURSDAY.—3 P.M. (Last Lumleian Lecture).

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, March 30th, to SATURDAY, April 4th.—WEST LECTURE HALL, Royal Society of Medicine, 1, Wimpole-street, W. Lectures arranged by the Fellowship of Medicine and open to all members of the medical profession. Monday, March 30th, at 5.30 P.M., Mr. Ernest Clarke: Myopia—Its Diagnosis and Treatment. Wednesday, April 1st, at 5.30 P.M., Dr. Robert Knox: Demonstration on X Rays in the Diagnosis of Lesions on the Right Upper Quadrant of the Abdomen.—CENTRAL LONDON OPHTHALMIC HOSPITAL, Judd-street, W.C. Lecture-demonstrations in Diseases of the Eye. Daily from 2.30 P.M.—ROYAL NORTHERN HOSPITAL, Holloway-road, N. Intensive Course (second week).

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
TUESDAY, March 31st.—4.30 P.M., Mr. J. Howell Evans: Nature's Reminders of the Humble Origin of Man. (Lantern Lecture.)
FRIDAY, April 3rd.—4.30 P.M., Mr. W. Ibbotson: Nasal Obstruction, Its Causes and Remedies.
Daily: In- and Out-patient Cliniques, Operations, Cliniques in Special Departments, &c.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, April 2nd.—4 P.M., Mr. Fairbank: Fractures.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, April 3rd.—4 P.M., Mr. Armour Brown: Suppuration of the Middle Ear.

MANCHESTER ROYAL INFIRMARY.
TUESDAY, March 31st.—4.15 P.M., Dr. W. Dyson: Bullous Eruptions of the Skin.
FRIDAY, April 3rd.—4.15 P.M., Dr. A. Ramsbottom: Medical Cases. Mr. C. Roberts: Surgical Cases.

Appointments.

ELLIOTT, T., M.B., Ch.B. Leeds, has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Misterton District of the County of Nottingham.

GORDON, J., M.B., Ch.B., D.P.H., Lecturer in Bacteriology at the University of Leeds.

HALL, PERCY, M.R.C.S., L.R.C.P. Lond., Hon. Actino-therapist to the Mount Vernon Hospital.

MACDONALD, J. R., M.B., Ch.B. Edin., Medical Officer to the Durham Board of Guardians.

TURNER, ADAM A., M.B., Ch.B. Aberd., D.P.H., Medical Officer of Health, Finchley.

Essex County Council: FRY, L. S., M.B., B.Ch. Camb., D.P.H., and LORRAINE, N. S. R., M.D. Edin., D.P.H., Assistant County Medical Officers of Health.

Vacancies.

For further information refer to the advertisement columns.

Benenden, Kent, National Sanatorium.—Res. Asst. M.O. £300.
Birmingham, Ministry of Pensions, Highbury Group of Hospitals.—Sen. M.O. £500.
Bradford City.—Asst. Sch. M.O. £600.
Brighton, Royal Sussex County Hospital—Hon. P.
Bristol Royal Infirmary.—Third Hon. Asst. Anæsthetist.
British Guiana.—Asst. M.O.H. £500.
British Hospital for Mental Disorders and Nervous Diseases, 72, Camden-road, N.W.—Hon. Phys.
Cardiff City.—Two Asst M.O.'s. Each £600.
Cardiff, Prince of Wales' Hospital for Cripples and Limbless.—Res. H.S.
Derby County Borough Isolation Hospital and Sanatorium.—Res. M.O. £550.
Derbyshire Royal Infirmary.—H.S. £200.
Dewsbury County Borough.—M.O.H. £900.
Durham County and Sunderland and Eye Infirmary, Stockton-road, Sunderland.—H.S. £450.
Hammersmith Parish.—Dist. M.O. and Public Vaccinator. £150.
Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—H.P. £50.
Hospital for Diseases of the Throat, Golden-square, W.—Hon. Surg. Reg.
Hospital for Sick Children, Great Ormond-street, W.C.—H.S., H.P., and Asst. Cas. O. Each at rate of £50.
Hull and Goole Port Sanitary Authority.—Asst. M.O.H. £750.
Johannesburg, University of the Witwatersrand.—Sen. Lecturer in Dental Anatomy, Physiology, and Histology. £450.
Liverpool County Borough, Local Education Authority.—Three Jun. Asst. School M.O.'s. £600.
Liverpool Eye and Ear Infirmary.—H.S. £100.
Manchester and District Radium Institute.—Asst. Radiologist. £500.
Manchester Royal Infirmary.—Asst. Res. Surg. O. at rate of £200.
Ministry of Health, Whitehall, S.W.—M.O.'s. £800.
Newcastle-upon-Tyne City Hospital for Infectious Diseases.—Res. Med. Asst. £350.
Newcastle-upon-Tyne, City and County of.—Tub. M.O. £750.
Newcastle-upon-Tyne. Hospital for Sick Children.—Hon. P. to Elect. Dept.
Paddington Green Children's Hospital, W.—H.P. and H.S. Each at rate of £150.
Prince of Wales's General Hospital, Tottenham, N.—H.S., Spec. H.S., H.P. Each at rate of £150. Jun. H.S. and Jun. H.P. Each at £110. Hon. Surg. Reg. and Hon. Med. Reg. Each £200. Also Hon. Asst. S. to Ear, Nose, and Throat Dept.
Putney Hospital, Lower Common, Putney, S.W.—R.M.O. £150.

Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Obstet. S.

Queen Mary's Hospital for the East End, Stratford, E.—Hon. Asst. P.

Redhill, Surrey, Royal Earlswood Institution.—Jun. Asst. M.O. at rate of £250.

Rochdale Infirmary and Dispensary.—Jun. H.S. £200.

Royal Chest Hospital, City-road, E.C.—Phys.

Royal Dental Hospital of London, Leicester-square, W.C.—Hon. Asst. Dent. S.

Sheffield Royal Infirmary.—H.S. £80.

Sheffield, University Royal Hospital.—Asst. Pathologist and Demonstrator of Pathology.

Shrewsbury, Royal Salop Infirmary.—H.S. £250. H.P. at rate of £160.

South London Hospital for Women, South Side, Clapham Common, S.W.—Clin. Asst. for Ophth. Dept. and Clin. Asst. for Surg. Dept.

West African Medical Staff.—Medical Officers.

Births, Marriages, and Deaths.

BIRTHS.

JACOB.—On March 22nd, at Bentley, Grays, Essex, the wife of Dr. L. G. Jacob, of a daughter.

SMART.—On March 19th, at Netherhayes, Seaton, Devon, the wife of A. H. J. Smart, M.B., M.R.C.S., of a son

MARRIAGES.

ANTHONY—COURT.—On March 14th, at Marylebone, Wilfred Mark Anthony, M.B., B.S. Lond., to Dorothy Court, M.B., Ch.B. Edin., youngest daughter of the late Dr. and Mrs. Court, formerly of Bolton.

DEATHS.

HUES.—On March 16th, at Gloucester, Frank Hues, M.R.C.S., Dial House, Handsworth, Birmingham, aged 60.

LONGHURST.—On March 20th, at the Homestead, Chandlers Ford, Hampshire, Arthur E. T. Longhurst, M.D., aged 94.

MAKEIG-JONES.—On March 18th, suddenly, at Conisboro, Seaton, Devon, William Makeig-Jones, M.D., J.P., aged 72 years.

MALDEN.—On March 19th, at Clarendon-place, Leamington Spa, Frank James Malden, M.D., aged 63 years.

MCGREGOR-ROBERTSON.—On March 17th, suddenly, Joseph McGregor-Robertson, M.A., M.B., C.M., of Buckingham-terrace, Glasgow, W.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

LANCASHIRE'S PANEL PRESCRIPTIONS.—The returns of the Lancashire County Insurance Committee show that the number of prescriptions has risen from 1,787,756 in 1922, to 2,026,460 in 1923 and to 2,438,273 in 1924. The corresponding numbers on the panel were 601,096, 617,577, and 629,907. The cost per prescription in the same order was 9*d.*, 8·65*d.*, and 8·06*d.* The total cost of medicines supplied to insured persons has risen from £67,070 in 1922 and £73,104 in 1923 to £89,983 last year. The average cost per insured person was 26·77*d.* in 1922, 28·41*d.* in 1923, and 34·28*d.* in 1924. The Southport Insurance Committee report that the total cost of medicines has risen from £2083 in 1922 and £2171 in 1923 to £2545 last year. The number of prescriptions in these years were 57,406, 61,585, and 69,691.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the Committee of the Fund 42 cases were considered and £642 11*s.* voted to 40 applicants. The following is a summary of the new cases relieved:—

Widow, aged 51, of M.D. Glasg., who practised in Glasgow and died in May of last year. Applicant is left with three sons, ages 19, 18, 13. The eldest is a dental apprentice, the second one a junior clerk at 15*s.* a week, and the youngest is at school. Applicant's only income is a share of a trust, £32; the estimated profit from one boarder 5*s.* a week and other charities have granted her £38. Rent and rates come to £126 per annum and the house is rented to May, 1925. Applicant is endeavouring to find a smaller one. Voted £20.

Daughter, aged 59, of M.D. Edin. who held a Government appointment in China and died in 1867. For the last 30 years she has maintained herself by painting Christmas cards, but suffering from neuritis impaired her capacity for earning. Last few years has been subject to hemiplegia which has left applicant partially disabled. Only income an annuity of £50. Rent £27 per annum. Voted £20.

Daughter, aged 28, of M.B. Edin. who practised in Perthshire. Applicant has been trained as a milliner, and her aunt found that her surroundings were unsuitable and removed her. The aunt is now endeavouring to get her to a cousin in Montreal who has a millinery business and has managed to raise the money with the exception of £20. Voted £20.

Subscriptions may be sent to the Hon. Treasurer, Sir Charters Symonds, at 11, Chandos-street, Cavendish-square, London, W. 1.

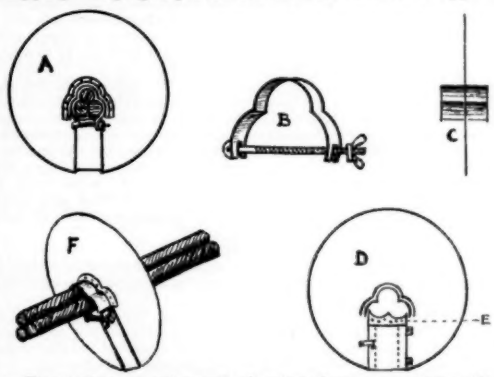
Notes, Comments, and Abstracts.

RAT-GUARDS FOR SHIPS' HAWSERS.

BY CHARLES F. WHITE, M.B., CH.B. MANCH., D.P.H., D.T.M. LIVERP.,

ASSISTANT MEDICAL OFFICER OF HEALTH, PORT OF LIVERPOOL.

IN view of the world-wide distribution of plague the problem of how to prevent the passage of rats between ships and the shore is of great importance in every seaport. No absolutely efficient and at the same time practicable method has yet been devised. Most countries require rat-guards to be fixed on all mooring-ropes, and certainly rats do use ropes as easily as we use the highway. I have seen rats run down an ordinary 8-in. rope at an angle of 45° with perfect confidence and safety. It is therefore necessary to guard ropes, but it is reasonable to suppose that rats will use the easiest means of travelling from ship to shore or shore to ship. Consequently it is futile to put rat-guards on the mooring-ropes of a ship with low free-board lying close against a quay, for naturally the rats will then go over the ship's side. This may be prevented by breasting the ship off four to six feet from the quay. But breasting off adds very considerably to the cost of loading and unloading cargo because of the longer lift necessary. Indeed, in the case of small ships it may mean a double lift. Such a tax on trade is not justified as a routine procedure. Where there is grave risk of the importation of plague infection, all efficient preventive measures are justified, because the interest of the individual ship must be subordinated to the interest of the public health and of other shipping. If plague preventive measures are to be applied,



A. Front view of rat-guard showing three ropes clamped by steel spring. Outside the spring is the collar and below the door, shut and providing no foothold for rats. B. Steel spring for three-rope guard with screw clamp. C. Side view of guard showing projection of collar on each side. D. Reverse side of disc showing hinges and fastening of door. E. Sheet rubber fitting on top of door. F. Guard fixed on mooring-ropes.

not only must the vessel be breasted off from the quay, great care being taken in placing the dummy barges so that rats cannot jump on to them from the bulwarks or through hawse pipe, &c., but also efficient guards must be placed on all mooring-ropes, even wires, and the gangways must be carefully watched or hoisted not only during the night, but at any time when conditions are quiet enough to tempt the rats abroad. Further, ropes hanging down to fenders or swinging loose may provide a means for rats to go to and from ships. The agility of the rat, particularly the black rat, must be seen to be believed. Lastly, undoubtedly rats go to and from ships in cargo, and when plague is suspected, either thorough fumigation must be carried out before the cargo is discharged, or every package that could conceivably harbour rats must be searched on the quay immediately it is landed.

Effective plague prevention is necessarily an elaborate and expensive proceeding, and cannot be applied as a routine to all ships. Some risk must be taken, but it should be reduced to the minimum that is practicable without laying an intolerable burden on trade. In attaining this minimum, rat-guards are undoubtedly valuable, but it is submitted that a general order that all ships should affix them to their ropes is unnecessary and may, in the case of small ships close to the quay, be ridiculous. Rat-guards should be ordered at the discretion of the officers of the Port

Sanitary Authority, but when they are ordered, an efficient type, properly applied and maintained in position, should be insisted on, because many ships' officers appear to think that any piece of tin applied to a rope will pass as a rat-guard.

After various experiments, I have no doubt that the plain sheet metal *rimless* disc 3 ft. in diameter, when properly fixed and retained at right angles to the rope, presents an almost insuperable obstacle to rats which they will not tackle at all unless hard pressed. I have seen them gain the edge of the disc when driven, but they have always fallen into the dock in attempting to reach the rope on the opposite side.

Hitherto the 3 ft. metal guard has been made in two half sections pivoted near one edge. In application the two halves are separated and the guard is dropped over the rope, the sections then being closed round the rope and held below by a clip. The central collar is then bound close to the rope. The division of the guard down the centre greatly weakens it, with the result that it will not withstand wind or any rough usage, the parts becoming bent in different directions and eventually separating altogether. They are often kept in use long after they are quite ineffective.

A modification of this type of rat-guard has been invented by Messrs. Bird and Sutcliffe in coöperation with the officers of the Liverpool Port Sanitary Authority. The drawings will give a good idea of the essential points in construction. The guard consists of a disc of galvanised sheet iron 1/16 in. thick and 3 ft. in diameter. The edge is left raw—i.e., not wired or turned over. In the lower half is cut a door hinged and so fastened when shut that no foothold is afforded to rats. The door slit leads to the central hole through which the rope passes. Round the central hole is placed a strong collar projecting about 4 in. on each side, and riveted to the disc. In the collar is a strong steel spring clip which can be tightened by the winged nut on the bolt (Fig. B). In application the door is opened and the guard put over the rope so that the latter passes up into the central hole, where a little force is necessary to overcome the spring of the clip. The guard will now hold quite firmly, but the bolt and screw closing the opening of the clip gives additional security. The door is then closed and fastened, the upper edge having a piece of thick sheet rubber attached so as to close completely the central hole whatever the size of rope in use. In the drawings a type of guard suitable for three ropes is shown, such being frequently necessary for large ships. Types are also made for two ropes, one rope or two or three wires, and any guard will fit ropes over a range of about 3 in. difference in diameter, so that any ship may easily be supplied with a set of guards suitable to her requirements.

The advantages of this guard are:—

(1) *Ease of Application.*—The guard is easily and rapidly applied to one, two, or three ropes and needs no binding in position.

(2) *Maintenance of Position.*—Under trying conditions of wind and alternate tightening and slackening of ropes the guard has maintained its position vertical to the rope for a week's test without any readjustment whatever.

(3) *Rigidity.*—Except for the door-opening, the guard is one continuous piece of sheet metal, and is therefore very much stronger than the older type. The riveting of the collar to the disc adds greatly to the stability of the guard, while the steel spring resists the bursting strain when two or three ropes alternately slacken and tighten with the movement of the ship.

The guard costs a few shillings more than the usual pattern, but this should be amply repaid in longer life and much greater efficiency. It is certainly the most satisfactory and practicable rat-guard yet produced.

I am indebted to Mr. J. H. M. Smedley, Chief Sanitary Inspector, Liverpool Port Sanitary Authority, for making the drawings. The guards are manufactured by Fred. Moore and Co., 46-48, Park-lane, Liverpool.

CARE OF THE DESTITUTE IN THE IRISH FREE STATE.

THE Minister of Local Government and Public Health in the Irish Free State has set up a commission to inquire into the relief of the destitute sick and poor, including the insane poor. Under this general reference, particular attention is to be paid to the examination of the existing laws and administration relating thereto. Investigations will be made into the laws dealing with assistance to the sick and poor in their own homes, in order that wasteful expenditure on healthy persons who are incorrigibly idle may be avoided, and a survey will be made of present machinery for affording relief to the following destitute classes: (*a*) Widows and their children; (*b*) children without parents; (*c*) unmarried mothers and their children; (*d*) deserted children. The existing provision in public institutions for the care and treatment of mentally defective persons will be examined and the commission will advise as to whether more efficient methods consistent with reasonable expenditure can be introduced, especially as regards the care and training of mentally defective children. Finally, with regard to the cost of relief of the destitute poor generally, the commission will inquire as to whether any change of law is desirable towards securing more equitable dependence on the local rates for persons who, having been normally resident in one poor-relief district, have become a charge upon the rates of another district.

The terms of reference of this commission are wide; they cover not only the Poor-law system (excluding medical treatment) but also the whole asylum system, and provide the opportunity for valuable reforms. It is to be regretted, therefore, that place has been found on the commission for one medical man only, nor is there any member possessed of special knowledge of the care of the insane and mentally deficient.

MEDICAL BOOKS.

WE have received from Messrs. W. and G. Foyle, Ltd., of 121–125, Charing Cross-road, London, W.C. 2, a new edition, dated March, 1925, of their catalogue of new and second-hand books dealing with medicine, surgery, nursing, and pharmacy. This catalogue covers an exceptionally wide range of medical books, and the prices asked for many second-hand copies will appeal to all doctors who feel that the necessary outlay on a medical library is nowadays a serious item of expense.

CALVES' FOOT JELLY.

CALVES' foot jelly is a very useful adjunct to sick-room diet, and the name of Messrs. Fortnum and Mason's, Ltd., 25, Kingsway House, W.C. 2, and 182, Piccadilly, W. 1, who have sent us samples of this invalid delicacy, is a guarantee of careful preparation. In order that the jelly may be of the highest efficiency, it is freshly made every day, and though in cold weather it will keep for 14 days, it is intended for immediate use. The jelly, flavoured with champagne, brandy, or lemon, is put up in screw-stoppered glass jars, the contents weighing six ounces. No preservatives are used in the preparation of the jelly.

ELIZABETH GARRETT ANDERSON HOSPITAL.

IF there is one thing about which we were clear, in a world where change of view is often necessary, it was that the cross-word puzzle should not find its way into these columns. Those responsible for the management of the Elizabeth Garrett Anderson Hospital, however, have forced our hands to this extent, that we feel bound to announce that a cross-word competition is in existence in connexion with the Extension Appeal Fund of the hospital. Communications on the subject should be made to Lady Plender, the hon. treasurer, at 144, Euston-road, London, N.W. 1, and should be accompanied by 1*s.* or more for the list of clues of the E.G.A.H. Cross-word Puzzle.

INCORPORATED SOCIETY OF CHIROPODISTS.

THE annual convention of the society was held at the London Foot Hospital, 98, Charlotte-street, London, W., on March 20th and 21st, where a series of lectures and demonstrations was concluded by a dinner at Restaurant Frascati. Proposing the toast of the Society, Mr. Norman C. Lake said it was no good denying that at present there was a certain regrettable lack of unison between the chiropodist and the medical man, but the former could do much to bring about greater coördination by taking full advantage of the facilities offered by the society for gaining a sound knowledge of the rudimentary principles underlying medicine and surgery. The fault, however, was not all on one side. The medical profession were also to blame. They required educating up to the value of chiropody. During the course of his hospital practice in particular he saw large numbers of cases of various foot deformities, and those which were not sufficiently severe to demand surgical treatment, but which he was afraid the medical practitioner was generally too busy to devote proper attention to, he referred, with highly satisfactory results, to the clinic at 98, Charlotte-street. Thus many of the poorer class who had hitherto worked under great difficulty owing to foot troubles had been enabled to carry out their duties in greater comfort. That was a very valuable service which ought to be more widely known and appreciated. Dr. J. H. H. McLeod, Dr. G. Slot, Mr. T. H. Openshaw, and Dr. E. P. Cumberbatch were amongst those present, and in the course of their speeches testified to the necessity for greater use being made of qualified chiropodists not only in private practice, but in hospitals and public clinics.

IN a recent advertisement of Messrs. H. K. Lewis and Co.'s publications, the price of "Lateral Curvature of the Spine," by R. W. Lovett, was inserted as 2*s.* 6*d.* net. The correct price is 12*s.* 6*d.* net.